1965

Instructional Media Utilization for the Community College

Gerald Russell Brong
Central Washington University

INSTRUCTIONAL MEDIA UTILIZATION FOR THE COMMUNITY COLLEGE

A Thesis

Presented to

the Graduate Faculty

Central Washington State College

In Partial Fulfillment

of the Requirements for the Degree

Master of Education

---

by

Gerald Russell Brong

June 1965

APPROVED FOR THE GRADUATE FACULTY

_____

Charles Wright, COMMITTEE CHAIRMAN

_____

Clifford Erickson

_____

Alexander H. Howard, Jr.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER I

INTRODUCTION

I. INTRODUCTORY STATEMENTS

On January 7, 1963, a statement applauding the current expansion of the community college system in the state of Washington was released by the presidents of the three state colleges and two state universities of the state. Dr. C. E. Odegaard states that community colleges should be viewed as " . . . an integral part of higher education" in the state of Washington and that " . . . the community colleges should belong administratively neither to the common schools nor to higher education, interpreted as meaning only the four-year academic colleges and universities" (50:20).

A community college, as the name of the institution implies, is an educational establishment with the function of serving the advanced educational needs of the supporting community. In many ways the community college is an extremely unique institution. Tyrus Hillway, in his book, The American Two-Year College, presents the various functions of the community college as follows:

1. The junior or community colleges are equalizing the opportunity for all students to seek and receive a high level of education.
2. . . . at least 49% of our citizens have the mental

ability to profit by fourteen years of schooling, while not less than 32% seem capable of succeeding in advanced liberal arts or professional education.
3. The community college may become a community service organization by providing such activities as lectures, musical programs, surveys, study groups, physical plant utilization, etc.
4. The curriculum of the community college may well include programs in vocational training and training for the semi-professions.
5. Adult education to meet the demands of the community.
6. Guidance and rehabilitation of any individual that desires help to overcome any problem that may block effective learning and success in educational undertakings (29:78-82).

Overview of the community college. Historically, development of junior colleges, or community colleges, is long and varied. Community colleges are a rapidly developing educational institution. The functions, according to Medsker, that have become ascribed to the community college are:

1. Providing terminal curricula of two years and less in length
2. Providing curricula preparatory to advanced undergraduate education in four-year institutions
3. Providing general education for all students, terminal and preparatory
4. Aiding students to make educational and vocational choices that are consistent with their individual characteristics
5. Offering a wide range of general and special courses for adults (39:vi-vii).

The community college is developing into an institution for learning whose program is related closely to the life of the community it serves. It is a college that, generally, has developed a program offering two years of

post-high school training. Sometimes the community college is only an extension of the high school system to grades 13 and 14. Most community college curriculums have developed with relation to the vocational and educational needs of the students.

Throughout its development the two-year college has made a number of contributions. Medsker states that the contributions of community colleges are:

1. The community college has democratized higher education by: lowering the cost of higher education, thus making it available to a wider group of people; bringing college to the individuals concerned; lowering academic requirements, making it possible for more students to have an opportunity with higher education; and, the community college is often concerned with remedial work.
2. The community college adds an additional type of educational institution to the already diverse American educational scene.
3. Students from community colleges have a very acceptable record of success (39:20-23).

Even with the successes evidenced by the community college there are some areas in which the institution has limitations:

1. The community colleges have failed to meet many of their claims: there is a lack of emphasis on the terminal programs; in many cases there is an inadequacy of student personnel services; and, there are deficiencies in general education offerings.
2. Many community colleges are very slow in the process of achieving a definite identity as to their specific function or role in the total educational program (39:23-27).

Increasing stress will be placed on the institution of higher education by the increasing number of college-aged youth desiring college training. This increase will be caused by the higher birth rate during the 1940's and the increased demands placed by society on young people for a college education. The four-year institution can provide only a part of the services demanded. These institutions best serve students demanding four or more years of college training. Programs requiring less than four years can best be served by institutions where the programs are designed for special courses and requirements. Community colleges have the capacity of being organized to meet the varied needs demanded by the offering of special courses or curriculums. Flexibility of program is a trait community colleges have been able to employ to good advantage (27:65-66).

The literature available that discusses the community college and its related curriculum mentions and expresses repeatedly the concept that the community-centered college will have a curriculum designed and arranged to meet the specific needs of the community. In our modern society the role of the individual and his relation to others may constantly be modified and as this role of the individual is modified the curriculum of the college must be modified. As high a degree of flexibility as is possible needs to be

included in any plan for a "true" community college.

In discussing the community service functions of community colleges, Henry states:

> The junior college serves its community through providing general education as well as vocational education. Moreover, the junior college can serve citizens who are not enrolled in any college program or course. It can assist in raising the cultural level of the community through providing varied public programs and cultural events; can aid in improving citizenship through forums and conferences, lectures, consultation services, and institute sessions. The performance of these and related functions becomes particularly important as the junior college assumes the characteristics and the role of a community centered college (27:68).

Generally, the community college is a service-centered institution attempting to meet the needs and requests of the specific sponsoring community. In order to maintain the philosophy of a community-centered institution, control of the college should remain with the group it serves--the community financing the operation (6:21-23).

Community demands will continue to increase as the public's acceptance of the community college continues to become all-encompassing. An example of this is a statement by Cooper on using the increased amount of leisure time available to members of our society:

> Leisure time in this country is not a luxury for a privileged few. With the eight-hour day, forty-hour week, vacation periods, and retirement programs well established in employment policy, leisure time has become a reality for the plumber, the mechanic, the office worker, and the industrial employee, as well as

> for the more affluent managers and owners of economic enterprise. We have leisure time, but we have no leisure class (16:9).

Educational institutions are increasing in their importance in assisting people develop creative outlets for basic intellectual and artistic impulses. Leisure time is becoming available to the majority of our society and an increasing number of people desire an opportunity to expand their means of expressing their creative impulses, or just to encounter additional intellectual challenges in gaining new skills and knowledges.

It is evident that a community college is established to serve all people in a given school district. As our society continues to become more complex it is becoming more necessary that our citizens have the opportunity to receive the maximum amount of educational training available. This training may be in academic or vocational classrooms, adult courses offered "on the job" to make it possible for workers to keep abreast of the expanding automation, or community education by the media of mass communication or the use of the college library. Evidence can be found indicating that the community college is an educational establishment that is rapidly becoming one of the most important educational institutions of the decade. Flexibility of program, broad base of offerings, community service orientation and accessibility to the majority of the educable population will

serve to increase the importance of the community college.

Role of instructional materials in education. The various types of instructional materials give shape and substance to the organization of the school curriculum and vitally affect the teaching-learning process. The broad area of materials utilization is one of the important problems in education today.

Selecting and using audiovisual aids to learning is not always an uninvolved task. Most classes on the college level contain material of a relatively sophisticated nature; generally, audio or visual materials, or a combination of both, will make the presentation of information more effective.

Many teachers today do not take advantage of the many aids to learning that are available. Audiovisual departments should be available to help guide effective selection and utilization of the various instructional materials and devices available. Utilization of many of the audio and visual aids to learning, if properly selected and effectively used, will increase the efficiency of the learning process.

Schools are rapidly moving away from a textbook-centered approach to institutional education. Many devices that aid learning are made available to the students in the modern educational process. These additional devices, or

aids to learning, should be centrally located in a resource center that is convenient to both students and staff (41:44).

The central materials resource center will contain materials that will be used by both staff and students involved in the instructional processes. The following types of materials may be found in the resource center:

1. Exhibits: dioramas, models, mounted specimens, etc.
2. Audiovisual materials: locally produced materials, films, filmstrips, slides, posters, charts, recorded materials, etc.
3. Reports (in printed form) from various private and governmental agencies
4. Books
5. Recordings: professional and student produced
6. Art: student works and loaned materials (an art display area would be needed)
7. Music library (20:101-102).

II. STATEMENT OF THE PROBLEM

Purpose of the study. It will be the purpose of this study to determine physical plant requirements and patterns of operation for an effective instructional materials program for community junior colleges. The data presented will contain a discussion of organization and operation of instructional materials centers as well as a review of physical plant specifications that will be beneficial in insuring the operation of an effective instructional materials program.

This report has been organized into five topical areas--each area will be considered a chapter. Chapter I,

this present chapter, will serve as an introduction and overview to the report; Chapter II provides an overview of the current community college programs, curriculum, community service and philosophy of community junior colleges; Chapter III will present a review of the current literature dealing with the instructional facilities where the actual instruction process will take place; Chapter IV, the section receiving the major emphasis in this report, will deal with the facilities and operation of the instructional resource center as it exists on community college campuses; and Chapter V presents a brief summary in retrospect of the content of this paper.

Scope of this study. Basically, this report includes a review of the current literature as it may be related to learning resources centers, college classroom design, administration of an audiovisual program, school administration, architectural design of school facilities, college campus planning and the production of learning materials.

Data for this report was obtained by reviewing available literature, corresponding with government agencies dealing with the topic of this paper, contacting selected commercial businesses supplying equipment and services in the area of instructional materials and having personal interviews with a limited number of media specialists and

personnel associated with community colleges.

The major sources of data for this report are the following:

1. University of Puget Sound Library Collection
2. Central Washington State College Materials Collection and Staff
3. Tacoma Public Schools
4. Washington State Department of Education
5. United States Department of Health, Education, and Welfare, Department of Education
6. National Education Association
7. Department of Audiovisual Instruction of the National Education Association
8. Department of Higher Education of the National Education Association
9. Eastman Kodak Company
10. Radio Corporation of America.

CHAPTER II

COMMUNITY COLLEGE PROGRAMS

A community college, as the name of the institution implies, is an educational establishment that has the function of serving the educational needs of the supporting community. Community colleges may have curricular organizational patterns that are two years, four years, one course, or any amount of time in length. Needs and requirements of the community supporting the college will be responsible for directing the total curriculum of the college--especially if the college is community centered. In many ways the community college has appearances like other operating educational institutions and in many ways the community college is an extremely unique institution.

"Currently in the state of Washington there is no area of education in which there seems to be greater interest than in the community colleges" (50:20). Through a review of the current literature pertaining to community colleges, there is evident much misunderstanding, or lack of agreement, in the function of community colleges and universities (and their roles in the total educational program).

Following is a discussion of the various programs that may be in operation as part of the total offerings by the comprehensive community junior college.

I. CURRICULAR ORGANIZATION

Thornton sees the public supported community colleges as:

> . . . a creation and servant of mankind, responsible to the will of its creator, ready to adapt to changing educational needs with appropriate educational opportunities. Its curriculums are judged to be effective or ineffective, good or bad, not by reference to an inherited definition but in relation to their effects on people (62:34).

The community college will generally operate with an "open door" admission policy. This means that any student meeting a minimum of admission requirements is given an opportunity to seek and possibly find success in the college program. Open admission does not necessarily mean that all students, just because they are admitted, will achieve success. Effective guidance of the student through an active guidance-counseling program should increase the student's probability of success.

A local community college operating with an "open door" policy, a minimum of tuition charges and a broadly diversified instructional program complements the programs of the comprehensive high school, technical institute and the college or university. It attempts to provide appropriately for the education of all citizens who sincerely desire and can profit from college study (62:33).

In addition to the reasons for attendance in a

community college stated above, Tyrus Hillway gives these reasons for community college attendance:

> Convenience of location, financial savings, and the availability of desirable two-year vocational programs probably constitute the most powerful forces impelling students to enter the junior and community colleges of America (29:12).

Major curricular functions of the community college can be listed, according to Hoeglund, as:

1. Guidance and counseling activities necessitated by a desire to insure the total or maximal development of each individual student
2. Remedial education as demanded by needs of students that, even though they possess adequate academic ability, have not developed an adequate command of basic skills necessary for further education
3. General education guiding the student into a condition in which he will be able to successfully operate in our complex society
4. Occupational and vocational training leading toward satisfactory employment in the world of work
5. Preparation for advanced study beyond the two years available at most community colleges (a transfer program)
6. Community service offerings to the supporting community (30:439-441).

Rapidly increasing stress is being placed on the institutions of higher education by the increasing number of college-aged youth desiring college training. This increase is caused by higher birth rates during the 1940's and the increasing demands placed by society on young people for a college education. Four-year institutions can provide only a portion of the services demanded; these institutions best serve the needs of students desiring four or more years of college instruction. Programs requiring less than four years

can best be served by institutions, such as the community colleges, possessing the capacity of extreme flexibility and adaptability necessary in offering shorter and more highly specialized courses (27:65-66).

Community colleges need to be designed and organized to accept their responsibility as community service institutions. Since communities are constantly changing, vocational activities are being altered, expectations directed toward students are being modified, campuses and curricular plans need to be flexible so that modification of the college to meet community demands will be possible.

Following will be a discussion of five interrelated aspects of the community junior college programs. These five areas are:

1. Transfer programs
2. Terminal programs (lacking vocational-technical specificity)
3. Vocational-technical training programs
4. Guidance activities
5. Community service offerings.

Concluding this chapter will be a section dealing, only superficially, with the junior college student.

Transfer program offerings. The majority of the students that seek admission to and enter junior colleges, both public and private, indicate that they fully intend to transfer to a four-year college. In actuality, only a minority of students indicating a desire to transfer at the

end of two years to a senior college do transfer (62:152-153). Even considering that a minority of junior college students do actually transfer to a four-year college, the community junior college transfer curriculum is of much importance.

Medsker states that:

> The transfer programs must satisfy the needs of students who expect to continue their education either in colleges of arts and science or in various professional schools, such as engineering, business, and law schools (39:51-52).

Students enrolled in transfer programs in community colleges need to satisfy not only the requirements dictated by the four-year institution for admission of a transfer student but the course requirements prescribed by the community junior college being attended. Many times the requirements of four-year colleges and junior colleges are not totally compatible. Communication between junior and senior colleges needs to be expedited whenever possible. The four-year institutions have a direct interest in the transfer curriculum of the community college. Community colleges and four-year institutions need to cooperate and communicate in their effort to produce a total educational offering (50:20). Four-year colleges do not assume a position of prescribing the total course offerings of community junior colleges. Requirements of four-year colleges and the universities must be taken into

consideration when organizing and giving continuity to the junior college transfer program.

Traditionally, transfer programs have been the major task that have been ascribed to the junior college (62:63). Thornton sees the following advantages for students in community junior college transfer programs:

1. Makes living at home and attending college possible because of the local availability of the community institution.
2. Low expenses to be borne by the student--part-time employment is possible in the local community and it is conceivable that funds can be saved to be used after the transfer is made.
3. Contributes to the equality of educational opportunity available to local students. College attendance may lead to the development of specialized talents that might otherwise be neglected.
4. Transfer programs tend to help fill the junior and senior years of the four-year colleges and universities.
5. Quality guidance programs are made available to the students. Remedial work can be offered the student that is just not quite ready for the college or university. Junior colleges also often help the young person loosen strong ties with the home (62:63-64).

Average academic aptitude test scores for junior college freshmen are lower than freshmen test scores in four-year colleges, but these differences are not statistically significant when it comes to predicting further academic success levels. It is not possible to draw any statistically valid conclusions concerning significant academic aptitude differences of four-year college students and junior college students (with reference to transfer students from the two-

year junior colleges) (62:150).

An integral part of the total junior college program will be the general education offerings. General education is defined by Thornton, in his book, The Community Junior College, as:

> . . . a program of education specifically designed to afford young people more effective preparation for the responsibilities which they share in common as citizens in a free society and for wholesome and creative participation in a wide range of life activities. It attempts to clarify the focal problems of our times and to develop the intellectual skills and moral habits to cope with them (62:61-62).

Many junior colleges, whether private or public, have not fully established their general education programs. Many times the junior colleges have established goals and specific objectives which may be reflected in course offerings of the institution, but in general the program does not operate on a level that is acceptable to many educators.

> No one should be too quick to criticize junior college personnel for not having done more. There are major obstacles that hamper progress. Re: The development of a general education program. The demands of vocational curricula make severe inroads on time for general education. The insistence on the part of senior colleges that junior college courses submitted for transfer credit be identical with their own is a real deterrent because, in meeting specific transfer requirements, the junior college is unable to set up its own general education program (39:62-63).

Transfer programs occupy a very important position in the total scheme of the community junior college. The

majority of the students entering the community college intend to transfer to senior institutions while in reality only a minority do. Because of the rigid requirements of senior colleges, junior colleges need to be very careful in establishing and justifying their transfer curriculums.

Terminal program offerings. For many students, attendance at a community college will be their last opportunity to participate in a formal educational program. As was stated in the previous section, a number of students indicate that they plan to transfer to senior institutions but for a variety of reasons the terminal point becomes the completion of the junior college program. Terminal curricula in a junior college, one of the functions usually ascribed to the community junior college, is any curriculum in any vocational-technical area that is of two years or less in length.

Community junior colleges with their open door admission policy will be serving a considerable portion of the college-age population with a terminal education program. This program may be a transfer curriculum, but more than likely it will be one of a multitude of vocational or technical curricula, such as: electronic technical training; engineering aid; medical assistant; secretarial skills; management training; etc. Community junior colleges should

have a selection of vocational-technical curricula that will meet the needs prescribed by the supporting community.

Hillway states that " . . . at least 49% of our citizens have the mental ability to profit by 14 years of schooling, while not less than 32% seem capable of succeeding in advanced liberal arts or professional education" (29:79). He points out that vocational training for the semi-professions is one of the very important functions of the junior college. This vocational-technical training needs to be skillfully augmented by a complete student guidance program (29:81-82).

A limiting factor in the offering of terminal semi-professional and vocational-technical curricula is the willingness of the institution to do so (39:53-55). In many school districts there is often a great amount of pressure to modify the comprehensive community college into a four-year liberal arts college, primarily because of a feeling of increased institutional status. In any case it is paramount that the true needs and desires of the community being served be taken into full consideration when planning curriculum.

For most students attending a community junior college, the terminal point in their training will arrive when they complete or leave the community college. It is very important that this last contact be effective. Even in

the terminal programs general education offerings of the college need to be of importance and meaning to the student. It is hoped that through participation in the terminal training program the student will become a worthy, self-respecting, respectable, stable and a good citizen in our rapidly changing democratic society.

Every educational institution at all levels in the total educational program should attempt to foster an attitude of inquiry in the student. Education is never completed. The skilled laborer or highly trained professional will, according to current trends, require some form of further training in order to maintain or improve present skills. This training, or education, may be formal and held in a college classroom or it may be totally informal directed by the inquiring mind of the individual. A specific curricular program may have a definite terminating point but total education does not. Education is a continuing process. The comprehensive community college needs to be ready to again serve the students who have terminated a specific curricular program and who return inquiring and seeking additional knowledge or skills.

Vocational-technical training programs. Junior colleges, if they are properly organized, are considered by many educators to be the most promising educational

institution for the offering of vocational-technical education or training (38:216). Technical education is a term, according to W. P. McLure, that can be applied to a wide range of vocational-occupational curricula that require from one to three years beyond high school for completion (38:215).

Thornton describes occupational education as follows:

> At the community junior college level, occupational education includes courses of two years' duration or less, combining the development of skills required for entry into a locally important occupation with related knowledge and theory calculated to help the student progress on the job. Such courses of study include also the general education calculated to prepare all students to assume responsible roles as citizens, as family members, and as individuals (62:59-60).

Occupational education, often referred to as vocational-technical training, is one of the basic functions of the comprehensive community junior college. The vocational-technical programs will be established and guided by the occupational needs and demands of the local supporting community.

Statements justifying the operation of a vocational-technical curriculum are made by W. P. McLure:

> . . . there are limitations on the degree of skill or competence that can be acquired at the high school level. The specialization is limited mainly to the craft level, semi-skilled work such as carpentry, plumbing, auto mechanics, and radio and TV repair (38:214).

He states further that:

> The high school does not provide all students with either the general education maturity or the time to develop specialized skills and knowledge to the extent required in higher technical levels of work. Thus, many individuals must plan to continue their education after high school if they wish to move into higher levels of specialization which are called for in sub-professional jobs (38:214).

Community colleges and community vocational institutions can be responsible for post-high school occupational training which does not necessitate extensive participation in one of the disciplines offered in four-year colleges. Generally, the four-year colleges are not equipped, staffed, and even in some cases willing, to offer occupational training apart from one of the academic disciplines (19:40). Comprehensive community colleges have the capability of serving a major portion of the citizens desiring training beyond high school in one of the many occupational fields.

Community college occupational vocational-technical training programs need to be maintained in as flexible or fluid conditions as possible. Occupational surveys of the supporting community will help the officials responsible for curriculum on the community junior college level give direction to curriculum development. "In developing its occupational courses, the community junior college depends upon continuous study of the locality" (62:38).

One very important part of the vocational-technical training program in any community college will be the adult

education classes designed for occupational retraining or original occupational training. Technological developments have forced thousands of workers to face new occupational demands--many times these workers are not prepared to accept the burden demanded by these occupational changes (38:212). The adult education program will play a very important role in the vocational-technical retraining, or the original training of adults, that may be needed in the supporting local community.

Flexibility in the curriculum organization will be necessary if the curriculum will have the capability of keeping pace with the needs of the community. Diversification of curricula is an accepted pattern in community junior colleges.

Student personnel and guidance activities. One of the major responsibilities of the community junior college is aiding students in the making of educational, vocational and personal choices that are consistent with the student's individual characteristics. This responsibility can be met by the operation of a student personnel and guidance program (39:vi-vii, 30:439-441, 29:82). The student personnel and guidance services can be one of the most important aspects of the community college program. Even accepting this fact it is interesting to note that many

colleges do not operate guidance services of a quality or quantity that is desired, or even deemed necessary (39:141-144). Each community junior college will be a unique institution; thus, there is no one best way to organize and coordinate a college student personnel and guidance program.

An effective guidance program will be a valuable aid in helping the student gain:

1. Facts about himself
2. Facts about the world of work
3. Facts about the social organization and operation of the modern world
4. Facts about employment prospects in various fields
5. Facts about training and requirements necessary to enter any given employment area (62:68).

All members of the professional staff at a junior college will have an important function in the full guidance program. The development of each individual student to his maximum level of achievement and personal satisfaction should be one goal held by each staff member having sustained contact with students.

An important aspect of the student personnel program on the community junior college campus will be the extra-curricular activities. These extra-class activities, will be a very important part of the total school program. In a community college or municipal college where many students are commuters the college may have difficulty in operating an effective extra-curricular program. Many of the students will have part or full-time employment. The activities

program will have to be modified to meet the needs of the students (19:53-54).

L. L. Medsker, in his book, The Junior College: Progress and Prospect, indicates that student activities are present on all community junior college campuses and that, according to his studies, usually a staff member(s) would be responsible for the activities of student groups. He lists some of the problems inherent in a community junior college activity program as:

1. The limited span of the college years
2. The absence of more mature students in the upper division
3. The tendency of students living at home to retain their home peer circle relationships and not develop new college associations
4. The long distances some students may live from their "day college" (39:157-158).

Suggestions for establishing a student personnel program are given by Medsker:

1. The student personnel program should spring from the basic philosophy and objectives of the institution.
2. Each institution should structure a plan for its student personnel program.
3. The program demands the services of a professionally trained staff.
4. If the plan makes the faculty responsible for counseling, it is recommended that: (a) time be allowed and (b) physical facilities and the housing of student records be such that counseling can be done in private offices where records are available.
5. A research program is necessary in order to obtain information about students and their progress.
6. The administration should interpret the objectives of the personnel program to the staff, students and community.

7. There should be a plan for close coordination between those who perform personnel services and those who teach.
8. There should be continuous evaluation of the total program (39:165-167).

Community service offerings. Community junior colleges, generally, will provide a program of services to be used by the community. Lectures, musical programs, surveys, study groups, physical plant utilization, library services, adult education, guidance services for "non-students," and special interest offerings (sports and social activities) will comprise the community service functions of the comprehensive community college (29:80-81, 30:440-441, 39:vi-vii). Community services, according to Reynolds writing for the 55th NSSE Yearbook, are provided by:

> . . . an extension of the regular school program in terms of the traditional school day, the traditional locations of the instructional activities, the traditional curriculum, and the traditional concept of students. Community services, moreover, often transcend the traditional definition of education in the sense of teacher-student relationships. In many instances this relationship is entirely absent (27:142).

Content and scope of the community service program will be governed by the needs and demands of the citizens in the supporting communities. It will not be practical for all community colleges to support service programs because of financial limitations, physical facilities limitations and lack of community interest and demand. Cultural presentations (concerts, plays, etc.) and sports presentations

may be a source of revenue for some aspects of the college program.

Many activities offered by a community junior college may be considered cultural in nature. These might include art classes, lectures, dramatic presentations, drama production groups, music classes, musical concerts, study groups, displays and hobby groups. This cultural service program may also include the use of facilities, equipment and professional staff.

Leisure time is on the increase for a large portion of our total population. This increase of leisure time has been reflected in the public's increased use of parks, libraries, art centers, etc. It is necessary for the public schools to be ready to help the supporting public use this time in a constructive manner (16:9).

Extended school day or adult education programs are an important aspect of the total community college program. Hillway states that:

> By adult education we ordinarily mean programs of self-improvement, either cultural or vocational (though sometimes merely recreational), pursued after the completion of formal schooling. Most of the students in such programs probably are 18 years of age or older (8:47).

Extended day, evening, or adult class students are generally highly motivated and eager to learn. They attend their classes and take part in their learning activities for

a purpose (36:427). These adult evening students, as reported by Los Angeles Valley Junior College, typically are: married; employed; between the ages of 21 and 40; and have a high school diploma. Two-thirds of these students are male and almost 60 percent are working towards the Associate in Arts degree (36:427).

Every attempt needs to be made to facilitate adult attendance at the college. Four major problems faced by adult evening students are:

1. Problem of arriving at school on time--student gets off work, hurries home and rushes through dinner and then drives to class.
2. Family life is interrupted.
3. There are many reasons why the evening student may be absent from class, get behind in school work, and get discouraged with class.
4. Lack of interest caused by poorly organized programs (36:428).

A comprehensive community college will need to have a program so organized that it will be possible for as many adult members of the community to participate in the program as possible. It will be necessary for the colleges to be ready to offer a class in any area to meet the needs of an adequate group of students. Physical plant facilities need to be so designed that they will be easily accessible at night by the adults. The college atmosphere needs to be so designed to appeal to adults, as well as young people.

II. COMMUNITY COLLEGE STUDENTS

In most of the tax-supported community junior colleges any student meeting a minimum of academic requirements will be given an opportunity to attend classes and attempt to achieve success. This open door admission policy does not insure a student success in the college program but at least an opportunity for advanced training is made available (62:35).

Thornton states some basic facts about the typical American community junior college student. Some of these facts are:

1. When all junior college students are considered (day and evening students, adult students and typical college-aged youth) there is a ratio of approximately three men to one woman.
2. Approximately 50 percent of the students will have an age of 18, 19 or 20.
3. Nearly 25 percent of all junior college students are married.
4. Most junior college students enter the freshman class with intentions of transferring at the completion of the second junior college year to a senior college. Only a small minority actually will make the transfer to the four-year college.
5. Approximately 33 percent of full-time junior college students maintain outside employment while attending classes (62:151-154).

Jeanette Poore, in her paper, "The Community College Student," for the Community College Research Symposium, offers the following statistics describing community junior college students in the state of Washington:

1. The total number of junior college students (both full and part-time) in mid-October, 1962, was 24,401.
2. Approximately 65 percent of the students were male with 35 percent female.
3. Nearly 31 percent of all students enrolled in collegiate institutions in October, 1962, were accommodated in the community junior colleges.
4. Married students total 37 percent, with 2 percent widowed and 2 percent divorced.
5. The junior college students who lived within the school district in which the college was located totaled 53 percent, 25 percent lived outside the district but within the county, 13 percent lived in contiguous counties and less than 1 percent lived in other counties of the state of Washington (51:2-6).

Reporting on a study conducted by the Center for the Study of Higher Education of Students, Medsker states that any differences in aptitude between entering junior college freshmen and freshmen at a four-year college are not statistically significant. There is a very broad overlap of general aptitude test scores (39:37).

It is difficult to justify a statement listing differences between junior college students and senior college students. The institutions from which the students come from are unique and thus, it can be expected that the students, considered in institutional groups, will have many unique qualities. As the academic vocational programs are unique, as students and their groups will have uncommon traits, so too, the instructional facilities will have a certain degree of uniqueness that can be attributed to student demands and program requirements.

CHAPTER III

INSTRUCTIONAL FACILITIES

The premise that the community junior college is generally organized around a service-centered philosophy is accepted by most people. Diversification of programs and curriculums is an accepted pattern in community junior colleges (62:37-38). Physical plant facilities needed by the junior college will, of necessity, be just as diversified as the program of the institution.

The junior or community college, according to Sumption and Landes:

> . . . generally houses the thirteenth and fourteenth grades. Like the senior high school, the breadth of the program determines the facilities needed. As the name implies, the unit provides space for college type facilities, which, in comparison with high school facilities, are usually characterized by larger libraries, more laboratories, individual offices for the faculty, and similar features (57:185).

In the next decade there will be twice as many students in colleges and universities as there are at the present time. It is expected that by 1970 the total college enrollment figures will approach the seven million mark. Expenses for the operation of colleges and universities will increase. This increase will be brought about not only by the increasing enrollments, but also the increasing expenditures for physical plant facilities (63:3). Between 1951

and 1955 enrollments increased by 562,183 students. During that same period $1,782,572.00 was spent on construction of new buildings. In other words, $3,170 was expended on new buildings for every additional student enrolled. Of this amount, $1,455 is accounted for in instructional space and the rest was spent on auxiliary facilities. With an estimated three million new students by 1970 it will be necessary to produce, according to the past record, over ten billion dollars for capital outlay (63:3-4).

Modern technology now offers higher education a desk full of teaching aids that can, hopefully, promote more efficient instruction. These tools may be used by both teachers and students to cope with educational demands (7:30). But yet, "One of the greatest obstacles to greater and more effective use of projected audiovisual materials is the absence of classroom facilities . . ." (21:223-224). Projected materials are not the only materials affected by the absence of adequate equipment and facilities. Instructional efficiency can be improved when the most adequate materials and efficient techniques are employed.

The design of the community junior college physical plant should encourage the intimacy of small groups, easy access to instructors, advisors, administrators and other students.

> The conclusion is inescapable: Nothing is certain about the shape of college facilities except the probability that what happens in them today will not be happening in the same way a decade from now. The educational process is changing, and college buildings must be designed to change with it (7:8).

The concepts of flexibility, informality, permissiveness and intimacy permeate the whole philosophical basis of the community college (59:2).

It is feasible, and possible, to build the average college building so that it will be usable, to a fair degree, for a period of about fifty years. Colleges should be able to design buildings so that they might expect at least a fifty-year return for each construction dollar spent (52:1). In many instances the college buildings planned and constructed now will still be in use seventy-five years from now. One of the major design problems is the planning for adaptability so that future programs can be accommodated (13:41).

It is advisable to keep the public well informed on the planning, constructing and maintenance of the physical plant. When a building is designed to serve the public they have a right to be informed on its constructional progress (56:348:349).

The purpose of this chapter will be to explore and relate some of the literature available, pertaining first to educational specifications (their purpose, composition and

utilization) and second, instructional facilities. No attempt will be made to outline the specifications that should be followed in planning any specific instructional facility.

I. EDUCATIONAL SPECIFICATIONS

Educational specifications, according to a bulletin released by the Tacoma Public School District while planning a local community junior college:

> . . . include a detailed description of the students to be housed, the kinds of educational activities that are to be carried on in each separate room and the kinds and amounts of equipment, supplies and furniture to be installed in each part of the plant . . . . The best educational specifications are confined to a clear statement of requirements which must be met and which will serve as a challenge to the architect to find the most imaginative and skillful solution to them . . . . They are the written program to bring the educator and the architect together in a sincere effort to understand and meet the requirements of students (58:1).

Purpose of educational specifications. The designing of any building is the function of the architect. He needs educational specifications for the building as a basis for his work. He needs to know the program that will take place in the building, age and sex of occupants, site location, special requirements of the program and some of the requirements for future flexibility (57:150).

Generally, the specifications for a new school plant will be produced by a group of people: school board,

planning committee, professional educators, etc. The people responsible for creating the educational specifications will become involved with a study of the students, community, curriculum, faculty and the other essential aspects of the educational program.

One frequently overlooked purpose of educational specifications is the guiding of the planning group and school staff in a general and critical evaluation of the tentative solutions proposed by the architect as solutions to the specific educational requirements listed by the school planning committee. The specifications will help both the architect and planning group in forming a clear picture of what the expectations for the plant should be (44:58, 46:83).

Physical plant facilities are one of the major factors that may limit the success of any community junior college (44:57). It is important that the planning group that produced the educational specifications and the architect be able to freely communicate ideas and explain concepts. The birth of the new plant on the architect's drawing board will be conditioned and guided by the knowledge the architect has of the use the plant is to be put.

Writing educational specifications. Generally, one and one-half years from the construction date, the

educational specifications should be produced (45:3).

When the composition of the educational specifications is begun, it is necessary for a "teamwork" approach to be used. MacConnell describes this teamwork approach as follows:

> The educational team consists of the governing board of the school system, the superintendent of schools, the professional education staff, the non-certificated or classified school staff, the educational consultant, the financial, legal and insurance advisors, and members of the community (33:77).

This team is responsible for the development of plans for functional facilities that will satisfy the full educational program for the community.

The National Council for School Construction states that:

> The educational specifications should be in written form and should include a description of the program and its underlying philosophy, a list of facilities needed (including equipment), statement with respect to any special needs as to location of different types of facilities, and descriptions of any special features required in each (46:8-9).

The Council also states that the educational specifications need to include a description of the varied activities to be carried on in a given area so the architect may better explore the different possibilities in planning (46:9).

Many school districts will have a school study committee, a junior college planning committee, or a school district advisory committee (or any other group that serves

in a consultant position in planning and operating school facilities and programs) composed of school district administrators, board members, lay people and construction advisors. Any of these groups may have the responsibility of composing the educational specifications.

Ten areas of importance that need to be considered when the educational specifications are composed and written are:

1. Present and probable future enrollments
2. Educational outcomes and considerations
3. Discernible trends in junior college education--indications that future educational patterns would be seriously limited by the kinds of teaching spaces now used
4. Special orientation requirements--relationship in connection with other components of the college plant
5. Internal traffic pattern--physical areas used by students and instructors
6. Furniture and equipment
7. Utilities
8. Color, decoration, acoustic and light levels
9. Specific materials to be stored in the classroom--departmental storage
10. Space requirements for unique spaces (33:249).

A Guide for Planning Community Junior Colleges in the State of Washington, authored by D. G. Morrison and A. C. Tjomsland and published by the Washington State Board of Education, states that:

> In a functional building, the major emphasis is placed on providing adequate space for desired activities in a pleasant and efficient environment. When a building is constructed, the breadth of the program and the effective operation of the college both are limited by the structure itself.

> Often when visitors are being taken on a tour of new college buildings, the proud president or faculty member will say wistfully, "I wish we had thought of that before we built it." The purpose of this chapter is to suggest the types of questions that should be considered during the planning of the building.
>
> If architects, administrators, staffs, curriculum directors, building specialists and lay committees together discuss these questions, there should be more understanding developed and less likelihood of thinking that there had been lack of foresight (45:7).

A series of questions is offered in the aforementioned publication that should be considered as the educational specifications are being produced and the plant planned. Selected questions are included here on the following areas of the college plant:

Art Department
Home Economics Department
Photography Department
Physical Education
Evening Program
Library
Science

These selected questions apply to the portion of the physical plant that will be affected by the utilization of much of the new media.

Art Department

1. How many students and how much space to adequately serve them?
2. What art programs best fit the needs of this community?
3. What provisions should be made for evening division classes? Should they be separate and apart from daytime classes?
4. What space should be devoted to counseling?

5. What services can be given to community organizations?
   a. Art service
   b. Rooms for use by art-interested individuals and groups
6. What is the most desirable location? What other facilities, such as the library, should be in close proximity?
7. Will there be integration of courses with other departments, such as the home economics, photography and woodshop departments?
8. What provisions should be made for display and gallery showings of both student and traveling exhibits?
9. What utilities need to be included in the plan?
10. What types of things need storage and what kinds of spaces (rooms, drawers, lockers, etc.) are best in which to store them?
11. How many sinks are needed to quickly expedite student cleanup in less than ten minutes' time?
12. What facilities for coats and smocks?
13. What kind of artificial lighting for even all-over illumination?
14. What window lighting is needed to provide maximum light with minimum shadows and reflections?
15. Can lecture space and laboratory space be used interchangeably or should they be separate?
16. What provisions should be made for blackout and projections of visual materials?
17. What library service should there be in the department? How can this be provided most effectively?

Evening Program

1. Is there an auditorium available suitable for groups from 100 to 300 for large lectures, concerts, recitals, etc.?
2. Are the lounges on the campus (student, faculty, etc.) available for groups, workshops, etc., and conferences and similar meetings?
3. Is the lighting in the classrooms adequate for evening work, especially in such rooms as accounting laboratories, where detailed work is done?
4. Are the buildings clearly identified and the rooms clearly numbered so that evening students can find their way about easily after dark?
5. Is there a coffee bar available for the use of evening students, at convenient, designated times?

6. Is the bookstore available for use of evening students at convenient, designated times?
7. Are special storage facilities needed to house equipment used in evening classes?
8. Is the campus adaptable for the holding of weekend workshops and similar types of activity?

Home Economics Department

1. Should the home economics department provide for experiences that contribute to effective home and community living as well as vocational and professional efficiency?
2. Is it advisable to have laboratory units representing different income levels?
3. How do junior college classes in home economics differ from high school or university classes?
4. Which of the areas in home economics require specialized classrooms and which could use general classrooms?
5. Should the furnishings in the living room be flexible to enable its use for classes in interior decorating, consumer buying, etc.; and also serve as a reception room for teas, guest speakers, etc.?
6. Are the facilities suitable for evening classes and community services?
7. What provisions should be made for visual aids, such as motion pictures, displays and demonstrations?
8. What provisions should be made for transporting supplies into the department and from one teaching station to another?
9. What health and safety factors are important in each area?

Library

In supporting the program of the junior college, the library must serve various functions. The philosophy and objectives of the institution must be reflected in its services. The book collection must provide materials for all courses taught and for all students admitted to the school.

The junior college library must help the student grow beyond his high school experiences. Many students in high school were assigned to a study hall when they were not in class and came to the library only on a pass from

the study hall. At the junior college it becomes necessary for them to learn self-discipline outside of the classroom. In the library they need study areas where they can work together with classmates and where they can receive assistance from librarians, as well as a quiet reading area for concentration on individual study.

The junior college library differs from the university library and the college library in that it serves a large group of vocational students, as well as lower division students who plan to transfer to other institutions. This necessitates a broader selection of books and magazines than is normal for the usual lower division academic students. However, the junior college will not need to provide the very technical and scholarly research materials of the university and college libraries for upper division, postgraduate and research program. Hence the large book capacity of those libraries will not be required.

1. What shall be the seating capacity of the library?
2. What plan can be adopted for future expansion of the seating capacity?
3. What shall be the maximum book capacity planned for at this time?
4. What plan can be adopted for future expansion of the book capacity?
5. What special uses will the faculty make of the library facilities?
6. Where should the library be located for maximum availability to students and faculty?
7. Is it desirable to have book cart transportation of materials to various classrooms and laboratories? What will be encountered in the flow of such materials? Traffic, ingress and egress from classrooms, etc.?
8. Will the services of the library be available to evening school students and faculty? To other people in the community?
9. Will there be proper space for audio-visual use?
10. Will there be proper space for a typing area for students?
11. What provision should be made for a busy study area?
    a. Students working together
    b. Reference and circulation of books
    c. Interchange of books from stacks to tables for examination use

12. A quiet study area?
13. A faculty reading room?
14. A book stack area or larger reading area to include free standing movable book stacks accessible to the general reading room?
15. A processing area for books and audio-visual materials?
16. A receiving area and pickup for books, periodicals, binding and audio-visual materials?
17. Staff offices?
18. Storage for library supplies and equipment?
19. Exhibit area: gallery, new books, attractive books in each subject field?

Photography Department

1. What is to be the emphasis in the teaching of photography?
   a. Physics
   b. Journalism
   c. Art
   d. Hobby
   e. Professional photography
2. What equipment is to be used in teaching such a program?
   a. Cameras
   b. Processing equipment
   c. Special equipment
      (1) Ozalid
      (2) Microfilm
      (3) Process camera
      (4) I. D. equipment
      (5) Other
3. What special rooms are needed?
   a. Number of stations or shooting areas, about 15 feet times 17 feet
   b. Studios
   c. Processing laboratory--how many stations
   d. Loading rooms and film tanking rooms--how many and where
   e. Reproduction laboratory
      (1) Equipment
      (2) Large
      (3) Arrangement
      (4) Proximity to other photo areas--since this tends to be primarily a service unit, its proximity to administration, journalism, library, etc., should be considered

f. Repair shop
g. Storage
h. Color processing areas

4. Miscellaneous?
   a. Ventilation--forced ventilation to all rooms
   b. Temperature control
   c. Communication with administration, public relations, library and school district

Physical Education

1. For what enrollment are plans being made?
2. What provisions should be made for evening use of the facilities?
3. Should the physical education program be for physical development exclusively or have recreational value also? What facilities will make for the best balance of these two?
4. What space should be devoted to counseling?
5. What services can be provided community organizations?
   a. For adult physical education
   b. For recreation
   c. For training of personnel for summer camps, playfields, etc.
6. What is the most desirable location of physical education facilities in relation to other campus buildings?
7. What provisions should be made for public demonstrations and competition?
8. What utilities need to be included in the plant?
9. What type of equipment needs storage and what kinds of spaces are best for this purpose?
10. What shower facilities are necessary for handling each class load in a minimum of time?
11. What toilet and lavatory facilities are necessary to handle regular daytime use of facilities? Night use? Where should these be located in relation to dressing rooms, gymnasium, pool, spectator seating?
12. What facilities are needed for hanging street clothes while the student is in gymnasium clothes? What type of locks or supervision is needed to protect property while students are absent from the dressing rooms?
13. What facilities are needed for storage of gymnasium clothes between classes? Should these be permanent or movable?

14. What ventilation system will be adequate for the size and type of building?
15. What type of lighting is best for even all-over illumination in each of the various types of facilities?
    a. Gymnasium
    b. Pool
    c. Showers
    d. Dressing rooms
    e. Multipurpose rooms
16. How and where should windows be located to provide light and ventilation but to avoid glare?
17. What arrangements must be made for lectures and the use of visual aids?
18. What should be the location of the outdoor teaching stations with relation to the indoor teaching stations?

Science

1. How can specialized science classrooms be planned to permit their use as general classrooms?
2. What rooms other than classrooms are necessary?
3. What differences in science classrooms are required in each science field?
4. How much space per student is required in a given class?
5. Can laboratory facilities be planned to make possible either individual or cooperative student work?
6. Would we provide for combination lecture-laboratory classes as well as for classes having separate lecture and laboratory sections?
7. What rooms will need to be open to student use out of class?
8. What utilities are required in each room?
9. What furnishings are necessary for each room?
10. What provision should be made for visual aid use?
11. What provision should be made for teaching through the use of displays?
12. How much and what kind of storage space is needed in consideration of multiple use of classrooms?
13. What provision should be made for receiving supplies in the building?
14. What provision must be made for preparation of instructional lecture and laboratory materials?
15. What provision should be made for student laboratory assistants?

16. How can we provide for availability of storerooms, etc., without interruption of classroom activities?
17. Should a departmental library be a part of our planning or is a single central library preferable?
18. What consideration should be given to health and safety factors throughout the science building?
19. Can campus landscaping be planned to facilitate teaching in botany and forestry (45:7-24)?

One important step that must be taken is the site selection. The site will have a pronounced effect on the type of plant that is designed. Characteristics to be considered in site selection and estimating the site's future value are:

1. Location of the site in relation to present and future population to be served
2. Size and suitability of the site to accommodate the buildings and spaces needed for outdoor activities
3. Physical features that will allow adaptation and development for continued use (13:47-48).

In many cases land that has the capability of serving as a junior college site will already be in possession of the school district. Whether land is already owned or it must be obtained, the site selected needs to fit the demands to which the college will be placed.

Utilizing the educational specifications. When the educational specifications for any school plant have been agreed upon and written, one paramount task has been completed. Now the specifications need to be developed into an operating plant.

The designing of any of the given buildings in the community junior college plant will be the responsibility of the architect. From the educational specifications the architect will create an operational plant.

> The architect has the responsibility of planning the school and handling the technical, administrative, and financial problems involved in its construction . . . he coordinates the services of all the engineers and technicians involved in the design of the school and directs the execution of the building by the contractors (28:154).

During the architectural planning of the physical plant, the architect will, more than likely, involve a "technical team." MacConnell describes the "technical team" as follows:

> The technical team includes an architect, a structural engineer, a mechanical engineer, a civil engineer, an electrical engineer, an illuminating engineer, an acoustical engineer, a foundation engineer, a color consultant, a landscape architect, and local and state government agencies (33:84).

Generally, the coordinator of this team will be the contracting architect. The specialized personnel listed as members of this "technical team" may be members of the architectural staff or they may be holders of sub-contracts.

Following the information given in the educational specifications, the fixed equipment should be specified by the architect. This fixed equipment includes such items as lab desks, bathroom fixtures, lighting fixtures, doors and other mechanical equipment. Most non-fixed equipment will

generally be selected by members of the educational staff (28:11).

Using the educational specifications and the preliminary architectural plans it is possible to compute estimated construction costs. The following factors need to be considered when computing an estimated cost figure:

1. Size of the project
2. Site conditions and location
3. Climatic conditions
4. Availability of material and labor
5. Quality and scope of facilities planned
6. Choice of fixtures
7. Desired educational efficiency (13:35).

"One frequently overlooked purpose of educational specifications," according to the National Council for Schoolhouse Construction, "is that of guiding the board of education and school staff in evaluation of the architect's tentative solutions to specific educational problems" (46:83).

II. INSTRUCTIONAL FACILITIES

College students and instructors will spend a large percentage of their time using instructional facilities--classrooms, offices, study areas, etc. Many varied tools of instruction are used.

> The tools of instruction (educational television, laboratories, lecture halls, auditoriums, electrical equipment, books, regulations, etc.) should be prominent only to the extent that they enhance the learning process. An overwhelming evidence of these tools could have an intimidating effect. Closed doors, counter

> barriers, vast corridors, expansive spaces, standing in line, things which make the individual feel small and insignificant would seem to have an inverse psychological effect on his ability to learn (59:1).

Specific specifications will not be presented here for instructional facilities. A discussion of general principles, as discussed in the literature, or current trends in instructional facilities will be given. It is difficult, if not impossible, to offer specific specifications, such as space requirements, mechanical equipment necessities, electrical and plumbing facilities, etc., without a knowledge of the specific program, college philosophy, aesthetic demands and site location to be met by the facilities.

When consideration is given to what is commonly called the traditional pattern of college instruction, certain inadequacies become apparent:

1. Traditional instructional techniques in college classes assume the students are motivated and ready to engage in abstract intellectual activities. Not all junior college students have this motivation. Many students need to develop a desire to obtain knowledges and skills.
2. Traditional programs and instructional techniques assume that the students have a background in the linguistic, quantitative, and conceptual tools required for advanced academic work. Not all junior college students possess this background.
3. Traditional programs assume that habits and attitudes are in harmony with the educational program and thus attention can be focused on development of skills and knowledges. Some junior college students are not ready to accept responsibility for their education.
4. Traditional programs assume that the student's out-of-class environment can be adapted to fit the

requirements of the academic course. This is not always true where the junior college student is concerned.

5. Traditionally oriented college programs assume a degree of homogeneity among students and their educational objectives (65:526-527).

According to Ordway Tead, most college teachers of the traditional variety are primarily talkers when they get into the classroom. They give lectures. They relate the assigned readings. Sometimes they read the assigned readings to their students. On occasion they may present a new and fresh synthesis of information (61:14-15). Instructional facilities should help the instructor break this "traditional pattern" of instruction. Equipment, materials and environment can encourage both the student and instructor in the quest for knowledge.

Facilities need to be designed to accommodate the most common types of instructional activities which, according to Brown and Thornton, are:

1. Formal lectures
2. Informal lectures
3. Group discussion
4. Other discussion patterns
   - colloquium
   - seminar
   - symposium or town meeting
   - panel discussion
   - debate
   - buzz groups
   - dialogue (interview)
   - forum-lecture (resource person)
   - brainstorming
5. Role playing
6. Demonstrations

7. Laboratory instruction
8. Case study
9. Field trips and community study
10. Telephone interviews (8:137-156).

College teachers can improve their classroom presentations as they become more aware of the instructional technology available to them. Currently, many college instructors make inadequate use of instructional materials (34:5-7). Each instructional unit needs a source of instructional materials and equipment that is available to students and faculty.

The bulk of equipment needed for classroom use in any building or physical unit should, if it is possible, be assigned permanently to that building. Trucking or moving equipment from building to building is costly in wear and tear on the equipment and time consumed. Storage facilities are needed in each classroom building or instructional unit. Equipment and materials are costly--they need to be maintained in operating condition so they may be effectively utilized.

It is suggested that:

> In buildings with more than one floor, elevators or ramps should be provided so that books, materials and equipment can be transported easily. Floors and entry-ways through which carts must pass should be free of obstructions. Kickplates and jamb protection should be provided where equipment must be moved through doors (18:12).

In planning and evaluating instructional facilities it is necessary to remember that a lack of adequate facilities will be one of the greatest obstacles to the efficient utilization of many of the aids to learning (21:223-224). Flexibility, adaptability, usability, all important qualities, are needed in any building that is designed for educational use.

Classroom design. The current trend in classroom design is to have them in widely varying sizes--large lecture auditoriums, seminar rooms and traditionally-sized rooms will be found. For efficiency of use the classroom needs to be adaptable to many different uses and users.

When designing an instructional facility it is necessary to comply with many building codes (most outlined by local or state building codes) for such items as fire escapes, rest rooms, entrance and egress areas, delivery facilities, electrical wiring, plumbing, mechanical fixtures, etc. After such items have been planned, it is possible to "design in" many of the features in the following discussion:

> With the increasing use of projectors, recording and playback equipment, closed-circuit TV, radio, intercommunications systems, the acoustical requirements of classrooms must be carefully considered . . . . Where available, an experienced acoustical engineer should be consulted to determine the required acoustical needs of classrooms (18:27).

The following recommendations for sound control in classrooms are made in the manual, Planning Schools for New Media:

1. Noisy areas such as gyms, cafeterias, shops and music rooms should be separated from other classroom areas.
2. Sound insulating qualities of building materials should be considered. Materials used in walls, ceilings, floors and insulation affect the noise level of the classroom. Need for special acoustical treatment in the classroom will depend partly on other materials used both in the classroom and in adjacent areas of the building.
3. Control of sound transmission between rooms should be provided in the structural design of the building. Transmission through partitions, ceilings and floors should be considered.
4. The classroom ambient noise level should normally be low enough that speech may readily be heard. Fluorescent lighting contributes to the ambient noise level of the classroom and ballasts should be selected with this in mind.
5. The center surfaces of classroom ceilings should be hard and sound reflective.
6. The building should be oriented to minimize environmental noises in the classrooms.
7. The heating and ventilating system should be planned to minimize noise (18:27).

Much of the new media requires light control. For the control of natural light it is possible to use drapes, shades, Venetian blinds, louvers and jalousies. Control of natural light is more difficult than the control of artificial light. Artificial light may be controlled by the many electrical-mechanical devices available for this purpose.

Whenever windows or other apertures used for ventilation must be darkened in order to use projected

materials problems may be created. Because of this:

1. Automatic ventilation and heat control for each room is desirable.
2. Normally six to ten changes of room air per hour are considered desirable.
3. The heating-ventilating system should be capable of both heating and cooling.
4. The system needs to be quiet. The mechanical engineer should specify the proper vibration and noise isolation equipment. Vent pipes should not transmit from room to room (18:26).

It is necessary that a system be provided so that light can be reduced to a level of approximately .1 foot-candle ambient room light on any front projection surface (66:208). Complete or total darkening is not necessary or desirable. The degree of darkness should be easily controllable. Care must be taken to see that the ventilation system does not transmit light.

According to W. C. Washcoe, lighting needed for classroom work can be classed as follows:

1. At desk top 35 to 50 foot-candles should be adequate for most reading activities. The level should be no higher because of furniture reflections.
2. Dimmable incandescent lights are more satisfactory than either switched or dimmable fluorescent lights (assuming the incandescent light color shift is not critical and heat dissipation is no problem).
3. The eye should not be subjected to frequent flashing of lights. Selected levels through the use of dimming are best.
4. Screen-image brightness should be at least twice as great as any bright area in the field of view.
5. Material viewed by reflected light such as charts, posters and chalkboard should be illuminated with light equal to or greater than other surfaces in the field of view. Thirty-five to fifty foot-candles are required and the direct illumination

should preclude surface glare (66:208-211).

Gibson and Foster, as cited by Caudill,[1] give an account of quality versus quantity problem in lighting:

> They say that the unit brightness of any surface viewed from any normal standing or sitting position in the classroom should, (1) not exceed ten times the brightness of the most poorly lighted task in the room and (2) be not less than one-third the brightness of the most poorly lighted task in the room, with provision that (3) the brightness of any surface immediately adjacent to any task should not exceed three times the task brightness (12:5).

Controls for the artificial illumination need to be quickly accessible and easy to operate. Natural light control devices need to be sturdy and easy to operate. Electrical switches need to be "electrically quiet," in that they should not create interference on radio and television.

Projection screens are now considered a standard item of equipment in classrooms designed for the new media. Following are some suggestions from the manual, Planning Schools for New Media:

1. For most rooms a 70x70-inch screen is desirable and a 60x60-inch screen satisfactory, considering all kinds of projection apparatus which may be used. Length of room and height of ceiling should be considered in selecting size of screen.
2. As a rule of thumb, screen and seating areas should be planned so that pupils viewing will be no closer than two image widths and no further than six image widths from the screen.

---

[1]Charles Gibson and Foster Sampson, "School Lighting Progress to Date and Some Suggested Next Steps," The American School and University, 23rd Annual Edition, 1951-52.

3. Supports for hanging wall screens should be strong enough to handle a 70x70-inch screen. These supports may be flexible to accommodate various sizes and types of screens, maps and charts, or separate hangers may be provided for the screen and for other uses. The latter arrangement is recommended, for a 70x70-inch screen will normally have to be fixed above the level of the top of the chalkboard or the screen will be too low for viewing.
4. Normally, the screen should be hung so that the lower edge is at the eye level of children seated in the classroom.
5. If overhead projectors are to be used to best advantage, the top of the screen should be suspended by brackets about 18 inches from the wall, with provision for fastening the screen to the wall at the bottom. This will offset the "keystone effect" or optical distortion encountered in the use of overhead projectors (18:28).

Location of the screen should follow the suggestions presented by the Eastman Kodak Company (23:5). (See the three figures on page 56).

In most schools today television is employed as an instructional tool. Televised instructional programs may be viewed in special TV viewing rooms, regular classrooms, instructional materials centers, or even in the student's own home (48:16). Receiving sets need to be placed so they may be viewed by all students. In many cases the sets will be mounted on wall supports or suspended from the ceiling in specially designed mounts, such as those supplied by the H. Wilson Corporation or the CONRAC Division of the Giannini Controls Corporation. Permanent installation of receiving sets is desirable but in cases where this is not

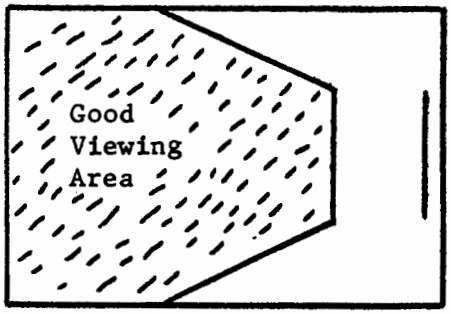


Figure 1. In a long, narrow room (more than 1½ times as long as wide), the best arrangement is usually that shown. A beaded screen or other narrow-angle screen is suitable.

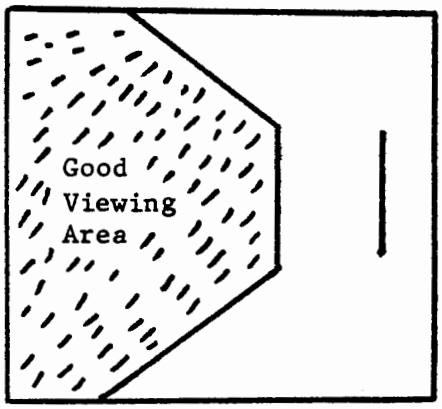


Figure 2. In "squarish" rooms, more people will be able to see satisfactorily the projected image if a matte or lenticular screen is chosen, because of the wider viewing angle it permits.

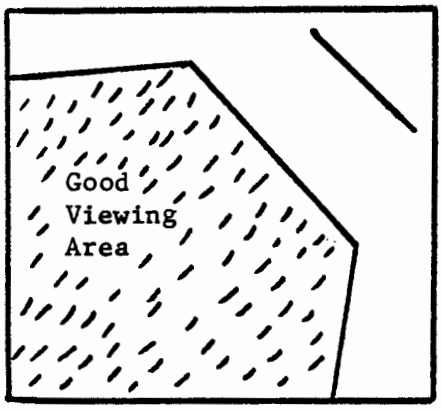


Figure 3. In "squarish" rooms, more people can often sit in the good viewing area if projection is diagonal. A slightly larger screen may be needed because of the greater maximum viewing distance.

possible movable carts of very sturdy design can be used. In some situations the small-screened portable receiving sets will be used. Facilities should be available to both originate and receive television signals in the classroom.

Each classroom should be equipped with an intercommunication system that would allow for rapid communication over the total school plant. Instructional programs may also be presented by way of this intercom system. The availability of outside telephone connections is highly desirable. In some classes it may be of value to use the telephone as a system to "reach out" of the classroom for audio contact with other people and places.

With the increased use of school buildings during the entire year it may be well to consider the possibility of total air conditioning.

> Although it is true there is not sufficient research data for establishing a definite relationship between learning and thermal environment, industry and business have concluded, on the basis of research findings, that performance is affected by thermal environment both above and below the so-called normal "comfort zone" (2:118).

It is advisable to consider the comfort of the people using a building--not only comfort in the classroom but comfort in halls and corridors, on stairs, in lavatories and in lounges.

When considering night school and adult education it is necessary to be aware of some special problems. The

traditional classroom arrangement poses some problems:

1. Formal arrangement of the room assumes that personal interaction will, for the most part, take place between the student and instructor. This arrangement will increase the competitive behavior among students and makes it difficult to set up dynamic group activities.
2. Formal classroom arrangement leads to passivity in the students.
3. The formal or ordinary classroom arrangement makes shy instructors uncomfortable and brings out the "ham" in other instructors (40:86).

When considering facilities to be used for night classes and other evening activities, easy access by automobile is advisable, as is the functional arrangement of parking space. Walks, paths and building exteriors need to be well lighted (43:80-81). Covered walkways between closely aligned buildings might be an advantage for both students and staff during inclement weather.

A special-purpose instructional area needs to be considered here. That area is the language laboratory.

"The term 'language laboratory' is used to describe any one of a number of rooms and spaces in public schools and colleges where recording and playback equipment is used in the teaching of speech, literature, foreign language and business education" (18:35). The purpose of the language laboratory, in whatever form it takes, is to provide opportunities for students to hear a language and to practice speaking it by responding to what they hear.

According to the manual, Planning Schools for New Media, consideration should be given to the following points when planning language lab space:

1. Convenient access to and from booths or tables by students.
2. Convenient access to all pupil stations by teachers.
3. Convenient access by teacher to console and to recording studio where one is provided.
4. The teacher should have visual access to all rooms, compartments and spaces in the area.
5. Booths should be planned so that students using them can view the front and center of the room when projectors and other teaching aids are used.
6. Dividers should be just high enough to shut out vision of students on either side when the student is seated. The booth front should be no higher than 10-12 inches from the desk top.
7. Individual room ventilation control is especially desirable in the language laboratory, where heat is generated from a number of sources, and where a high degree of student concentration is demanded.
8. The electrical lighting system should not interfere with the sound system.
9. The electrical system of the laboratory should be isolated so that turning off lights and appliances in other parts of the building and other disturbances will not cause interference or power failure in the language laboratory.
10. A master switch should be provided that will turn off all electricity in the laboratory except the overhead lights.
11. Wiring at each booth should be located and designed to minimize tampering and accidental injury to equipment and students.
12. Wiring should be accessible and easily alterable. Circuits and installations should be designed to permit checking and servicing with a minimum of interruption of instruction.
13. Both artificial and natural light control should be provided for the language lab.
14. Where individual instruction is desired, both student and teacher selector controls should be provided.
15. When teacher monitoring is provided, the system should enable the teacher at any moment to listen to one student's master, response, or recording

and to speak to the student without passing through another student's circuit.

16. When teacher communication with the student is provided, the teacher should be able to turn off one or several student's master without affecting the master of other students on the same master circuit.
17. Where teacher communication with students is desired, such communication should be possible at any time during listening, playback, or stop conditions.
18. The console should be provided with a lid or cover that can be locked to prevent tampering.
19. Adequate storage should be provided for tapes, records, student books, equipment, cards and spare parts. Storage for tapes and records should not be located close to any source of heat or strong magnetic field (18:37-39)

Selection of equipment to be used in the language laboratory is an extremely important phase of establishing the language laboratory. "The one technically-based commodity which the chosen system must supply, and continue to supply, is the high-quality recording and reproduction of speech" (26:44). Hayes further states, "It cannot be overstressed that adequate sound reproduction for foreign language instruction requires a quality standard second only to that of high-fidelity professional recording and reproducing equipment, much higher than that needed in applications whose primary requirement is the intelligible reproduction of native language speech" (26:46).

Instructor stations. Instructors need special work areas where they will be able to carry on their non-teaching activities, as well as their activities of preparation.

Instructors need available to them office space, reference libraries, production areas, lounge facilities, comfort stations and conference or meeting areas. Often students and instructors will be able to share some of these facilities.

In order to understand the needs of instructors it is necessary to consider the tasks of these teachers. These tasks are:

1. Meeting the class
2. Preparing for the class
3. Maintaining office hours for student conferences and advising students
4. Responsibilities to the department, college and profession
5. Research
6. Developing orders for instructional materials
7. Reading literature related to one's discipline
8. Time for thoughtful discussion between individuals--this is the essence of the intellectual life
9. Miscellaneous responsibilities--trips, letters to colleagues, professional conventions, etc. (8:42-43).

Private offices need to be available for members of the professional staff. In planning for a large institution it would be advisable to have available for each department a small, well designed, semi-private work space for the local production of instructional materials.

Each office should have adequate heating and ventilation, light and space. The size of the offices and their layout will depend on the tasks assigned to the person occupying that office. Each office should afford privacy.

Each office or group of offices should have an outer office with a receptionist and facilities for a secretary, assuming one is needed. A reception area with a comfortable, relaxing atmosphere should be located adjacent to the office space.

Throughout the instructors' office area there should prevail an atmosphere of learning, a balance between formality and informality, a controlled-permissive atmosphere and an air of intellectual activity. Junior college instructors need to be available to the students. An opportunity for discussion between participants at the junior college needs to be available.

Student stations. It is necessary to consider student stations in the light of the students' activities generally expected in the teaching-learning situation. Brown and Thornton list these student activities as:

1. Assigned reading
2. Assigned listening and viewing
3. Papers and written reports
4. Committee work
5. Oral reports
6. Creative projects
7. Teaching machines and programmed study
8. Work experiences and internships (8:156-163).

Student stations include the areas in which the student will carry on the activities listed above. These stations may be in the classroom buildings, special study areas,

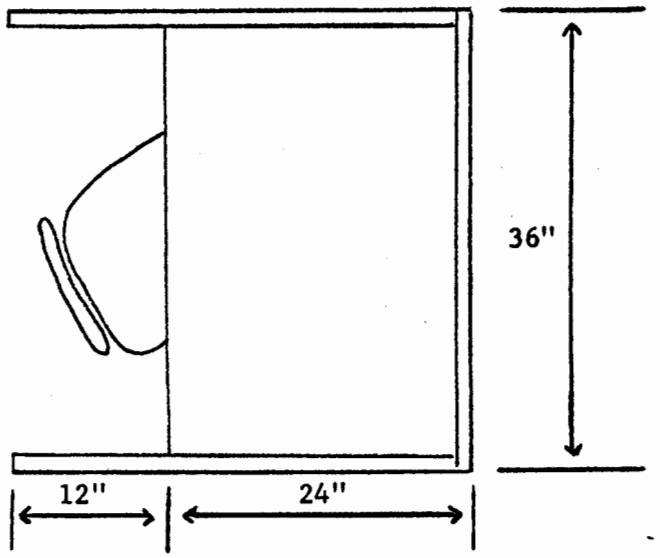
instructional materials centers, or any other instructional area designed for student use.

> With a larger proportion of the students' time devoted to lectures, the seminar room and study desk will assume a new and critical importance. If the material offered in the lecture hall is to be explained, amplified and questioned--if real teaching rather than simple transmission of facts, is to occur--maximum effectiveness must be built into seminar rooms, classrooms and individual study facilities (7:31).

The booklet published by Educational Facilities Laboratories entitled, Study Carrels - Design for Independent Study Space, lists the basic dimensions of the simplest type of study carrels that can serve as individual student stations. These general dimensions are:

1. The working surface should, minimally, be two feet deep and include about six square feet of working surface.
2. The height of the visual "blinders" should be slightly above the eye level of the seated student. This is approximately 20 inches above desk height.
3. If the carrel has a two foot by three foot rectilinear desk the side barriers should extend, toward the student, one foot behind the edge of the table. If the table is not rectilinear the designer will have to use his own judgment to determine proper dimensions.
4. Bookshelves should generally be ten inches deep.
5. It should be possible for two people to sit at one carrel when necessary; either two students or a student and teacher (5:2).

This EFL publication, written by John Beynon, dealing with carrels is organized around a series of drawings showing many various types of individual study carrel types. (Drawings of selected carrels are included on pages 64 and 65.)



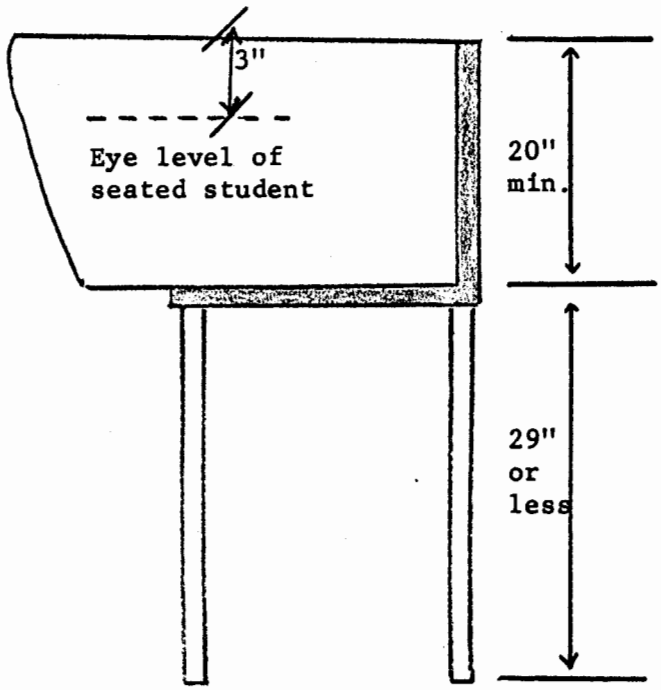
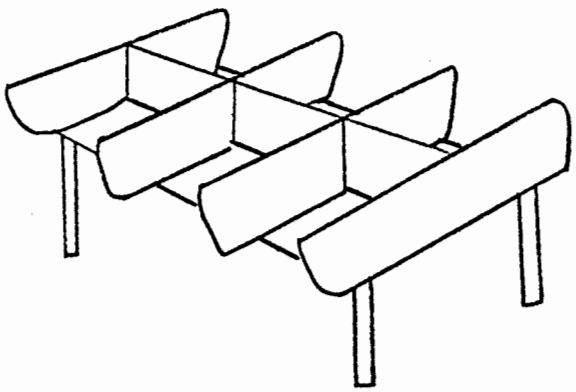
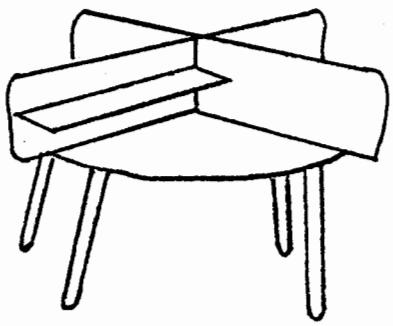


Figure 4. To the left is shown a carrel of very basic design. A carrel of this design may be placed along a wall, side-to-side or back-to-back. Shelves may be included to add to the convenience.

Figure 5. Standard library furniture is shown below divided into very simple carrels.





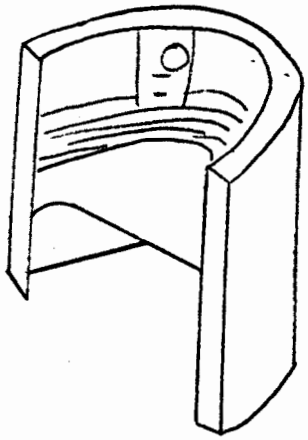


Figure 6. The barrel carrel, left, is a self-supporting unit affording uncluttered work space and privacy. These units can be arranged in many group patterns (one is shown below).

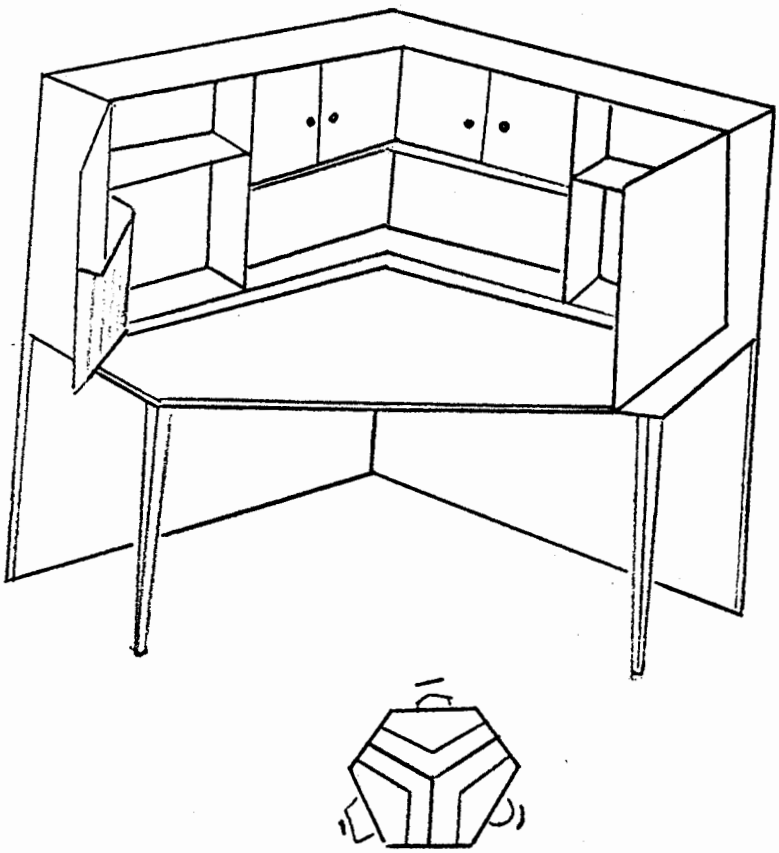


Figure 7. A complex carrel design, left, designed to serve as a home station for students. Book and equipment storage is provided.

Drawings from Study Carrels: Designs for Independent Study Space, John Beynon

Generally, it will be necessary to supply carrels with an individual light source to counteract the shadows cast by the blinders. Major light sources will be the room overhead lights. Electronic machines will often be used in the carrels, thus it will be necessary to provide electrical power outlets (5:2).

Areas need to be provided for students to work in groups. Conference rooms should be located in classroom buildings as well as the instructional materials center.

Lounges, in close proximity to the instructional areas, can be used for informal activities--social or academic. Furniture in these lounge areas needs to be durable as well as comfortable; physical surroundings need to relate to an atmosphere conducive to the operation of the academic community.

CHAPTER IV

THE INSTRUCTIONAL RESOURCE CENTER

I. PHILOSOPHY OF THE RESOURCE CENTER

During the last decade the function of the college library has changed to include a philosophy of library services which has freed the library of much of its rigidity of use. A greater variety of materials and a wider selection of services are becoming available to student and faculty. Facilities of the modern library are open--students have free access to the stacks. Space is usually arranged so students may browse or use informal reading or lounging areas. Community college libraries are especially in need of areas that make independent and group study possible (3:148-149). Resource centers have the potential to serve as the academic centers for the institution.

> The modern concept of a college library is no longer that of a storehouse for books. The library now is an instructional materials center wherein all library materials should be centralized. With the advent of new means for storing knowledge such as tapes, films, slides, filmstrips, records (stereo and monaural), microfilm, microcards, photostats and the various other devices, new storage areas must be added to those traditionally reserved for books and periodicals. In the not-too-distant future the library will have to be considered most seriously as a location for the huge computers which so aptly store vast amounts of knowledge (55:38).

It is generally accepted that the junior college library should provide materials for three basic purposes:

1. For use by instructors and students in every course offered
2. For wider and more distinctly cultural reading by both students and instructors
3. For problems of investigation and research as may be developed on the community college level (1:14).

Most instructional materials resource centers operate as a service agency for students and teachers in an attempt to facilitate the teaching-learning process. The materials center can serve as the nerve center for the school's total instructional program. Describing instructional materials centers, David Beggs III states that:

> An instructional materials center (IMC) is a place where ideas, in their multimedia and diverse forms, are housed, used, and distributed to classrooms and laboratories throughout the school. The IMC contains books, magazines, pamphlets, films, filmstrips, maps, pictures, electronic tapes, recordings, slides, transparencies, mock-ups, and learning programs (4:602).

Individualized instruction can be facilitated by the establishment of an instructional materials center. Materials of varying nature are needed in abundance and adequate space for uninterrupted work is a necessity in the materials center. The IMC is the most logical place for students to work because the materials, equipment and space are available.

According to a year-end survey undertaken and reported by the publication, Educational Screen, the primary functions of instructional materials centers are:

1. Maintain a pool of basic and specialized learning materials

2. In-service training for instructors to help improve the utilization of materials
3. Maintenance and circulation of materials and equipment
4. Local production of unique materials needed by teachers and students (53:675).

One of the major functions of the instructional materials center is the supplying of what has traditionally been categorized as audiovisual materials and related equipment. "The Audio-Visual Department is a service unit engaged in the selection, procurement, cataloging, preparation, distribution, maintenance and storage of all AV materials . . ." (49:488).

II. SERVICES OFFERED IN A RESOURCE CENTER

Generally it is accepted that the storage, cataloging, inventorying and distribution of all instructional materials should be combined in one centrally located center, designed to assure coordinated and efficient utilization of instructional resources.

> Recently, higher education has exhibited a trend toward a new kind of support for instructional services and an extensive development of facilities to encourage the utilization of new media. This trend is founded on the changing roles of college teachers and influenced by increased enrollments, rising costs, and growing understanding of the psychology of learning (9:vii).

New teaching techniques and configurations are on the increase (re: team teaching, independent study, seminar, etc.) (42:520). These new techniques need to be carefully

selected and put into an operative state. No matter what technique is employed by the teacher, the college teacher should possess a degree of showmanship. He needs to be able to attract and hold attention by "legitimate" means. In order for communication to take place, the student needs to be receptive (61:45). Many times the instructional materials center will be able to provide many of the tools the creative teacher will need to obtain and hold the student's attention.

M. I. Rufsvold, in her book exploring school library services, indicates that the resource center needs to make available certain services. These services are:

1. Selection and utilization of materials: services to teachers. Helping teachers select and gather materials for instruction; keeping teachers informed of new developments and techniques in the media field; and the production of aids to learning.
2. Selection and utilization of materials: services to pupils. Giving assistance to students in the selection and uses of tools for learning; keeping pupils informed of services and techniques available for the gathering of information; and helping students solve problems by making all needed learning materials equally available to all.
3. Production of materials: materials needed for instructional purposes. Helping pupils and teachers participate in the actual production of learning materials.
4. Administration and distribution of learning materials. It is necessary to insure maximum utilization and availability of materials and equipment. Accessibility of materials, equipment, and assistance personnel is very important. Purchase and servicing of materials and equipment is also a service of the center (54:5-8).

With the resource center playing such an important role in the total academic program it is very necessary for the instructional materials center to " . . . be located centrally for the efficient distribution of equipment and materials and for convenient use by teacher and student" (18:12).

Education, as has already been stated, is a very complicated and involved process. Amo DeBernardis and others give the following list of aids used in the education of the individual student:

intercom	slide - filmstrip projector
PA systems	teaching machines
telephone	programs
radio	television
recorder - tape	video - tape
tape playback	opaque and overhead projector
disc playback	microfilm
language lab	microprojector
books	slide camera
periodicals	photographs
chalkboards	maps, globes
paper	charts
typewriters	paintings
duplicators	drawings
movie projector	sculpture
film	models
filmstrips	laboratory equipment
tools	construction materials (18:4).

The learning resources center on the community college campus must be a totally service-centered organization if it is to justify its existence. Individuals using the facilities of the resource center will be in need of pleasant facilities, optimum conditions to carry on their

work and technical assistance from trained personnel.

Materials need to be available to help students in their complex learning tasks just as materials need to be available for instructor use. Technicians and specialists in the communication field need to be available for consultation in the center. These specialists need to be ready to do more than run machines and produce audiovisual materials. They need to be ready to work with the people, the consumers of their services, in an attempt to further instruction (7:46).

Philip Lewis states that the educational communication specialists, or audiovisual specialists, depending on local circumstances, should be prepared to:

1. Be directly involved with curriculum planning.
2. Promote among teachers, administrators, school governing bodies, and school patrons the concept that the use of resource materials is integral to instruction and not an adjunct to be used when time permits.
3. Establish an educational climate suitable for the optimum use of instructional media and materials.
4. Develop new measures for determining the effectiveness of instructional materials in specific applications.
5. Be responsible for evaluating emerging innovations for possible introduction into the learning process and for interpreting and promoting those innovations which can make a significant contribution.
6. Become involved in the development of central classification systems that will permit rapid location of related instructional materials for specific learning situations.

7. Arrange for the acquisition or production of instructional materials which are not readily available but are necessary for the instructional program and provide the incentive, training, and materials for production by teachers and others.
8. Provide consultation opportunities for all teachers, including teacher-in-training, to secure assistance in the use of new media and materials in their lesson planning.
9. Contribute to the improvement of methods of communication within the profession on matters relating to the emerging practices and innovations, the exchange of ideas, and the establishing of liaison with outside agencies--the clearing house idea.
10. Be involved in decision-making activities on such matters as building planning, classroom design, etc., as they affect the instructional program.
11. Assume the leadership responsibilities for initiating programs or activities that will bring about needed improvements and innovations.
12. Develop and implement instructional systems involving automation approaches to expedite free flow of information and ideas (communication centers, learning laboratories, random access devices, etc.).
13. Make use of research results.
14. Provide a variety of well-selected instructional materials and equipment, easily accessible for use by teachers and pupils and give encouragement and/or administrative support for the effective use of these materials (32:16-17).

(These fourteen functions are reported by Lewis from the Seventh Lake Okoboji Audiovisual Leadership Conference, sponsored by the State University of Iowa and the Department of Audiovisual Instruction of the NEA--April, 1961.)

Assuming that these duties of the communication specialist are accepted, the communication specialist will be an integral member of the college instructional team. It is also evident that the audiovisual specialists cannot work

alone--the media specialists must be able to operate as advisors or consultants across academic field lines.

The instructional materials center will house and make available a wide selection of materials for both students and staff. The following types of materials, normally, will be housed in the center:

1. Exhibits: dioramas, models, mounted specimens, etc.
2. Audiovisual materials: locally produced materials, films, filmstrips, slides, posters, charts, recorded materials, etc.
3. Reports (in printed form) from various private and governmental agencies
4. Books
5. Recordings: professional and student produced
6. Art: student works and loaned materials (an art display area would be needed)
7. Music library (20:101-102).

Part of the services provided by the instructional materials center is the availability of physical facilities. The following areas should be considered basic:

1. Individual and group research area
2. Projection rooms for showing films to groups
3. Microprojection room for one person
4. Recording of voices and playback facilities
5. Display areas
6. Meeting areas for groups up to 30 in a seminar-discussion situation
7. Servicing and storage areas for the equipment of the resource center
8. Small group conference rooms
9. Facilities for dividing larger rooms into smaller areas.

It is important to stress the concept stating that the services made available by an instructional materials center on the community junior college campus should be

predetermined by the philosophy of the institution and the curricular offerings. Services will be structured by the physical facilities that house the IMC.

III. PHYSICAL REQUIREMENTS OF A RESOURCE CENTER

Materials storage. The storage facilities area for audiovisual materials must be designed for the following:

1. Racks for storage of maps and screens
2. Space for globes, dioramas, models and exhibits
3. Storage for filmstrips, slides, tapes, recordings and films
4. Storage for science demonstration carts
5. Storage for pictures and specimens (18:16).

Storage and distribution spaces are among the most important areas in the center. Possibly the center has an extensive collection of learning aids--this collection will be of little value if it is not stored in a manner that makes it accessible. Materials from the center will also be used in classrooms in other parts of the campus. This makes distribution space important. Erickson makes the following comments on the layout of storage and distribution spaces:

1. When planning space needs the director should look into the future ten years or so and try to visualize the programs of the audiovisual department and its scope of operation.
2. Operations need to be arranged within spaces allotted in terms of the natural flow of work.
3. Arrangements for adequate light and ventilation are very important. Working at close distances on fine materials, sometimes with toxic chemicals, can be very taxing when a proper atmosphere is not present.

4. It is urgent that film materials be stored at normal humidity and temperature conditions; hence a separate room is advised where the air can be properly conditioned. Such vaults should be conveniently located to all work areas. Doors to film vaults should be wider than usual to allow carts to pass through. Sliding doors save the most space.
5. Equipment storage should be close to loading and issuing areas. Ventilation or air conditioning is advisable for equipment storage (21:270-273).

One of the most widely used audiovisual aids that requires special storage is the 16mm motion picture. Motion pictures are, generally, expensive to purchase or to produce locally. To insure the maximum life possible, storage must meet certain conditions. (The assumption is being made that the community college resources center will have a permanent collection of material on photographic film--motion pictures, slides, filmstrips, still negatives, etc.) The Eastman Kodak Company, one of the largest producers of photosensitized products, recommends the following storage procedures:

> Film Cans--Films should be stored in film cans or boxes. These protect films and photographic materials from dirt and dust in the air.
>
> Storage Cabinets--Metal cabinets are advised, though wood is very satisfactory. The cabinets are usually supplied with adjustable shelving to accommodate various standard sizes of film reels. Film cans or cases should be stacked on their edges so that any particular one can be removed without disturbing the rest. Do not set cabinets tightly together, but separate them to permit free circulation of air on all sides. Cabinets should be located on the main floors of buildings, never in basements which are nearly always damp nor on the top

floors of uninsulated buildings which may be too hot. The storage area should be away from steampipes, radiators, hot-air ducts, and other sources of heat.

Storage Conditions

Table of Temperature and Humidity Recommendations for Storage

16mm Movie Films	Long-Term Storage		Films in Active Use	
	Temperature	Relative Humidity	Temperature	Relative Humidity
Black and White	Below 80°F.	40% - 50%	Below 80°F.	25% - 60%
Koda-chrome (color)	50°F. or less	25% - 40%	Below 80°F.	25% - 60%

If relative humidity exceeds 60% for any length of time, dehumidification is required; if relative humidities are below 25% and brittleness is encountered humidification is required.

It is very often advisable to supply the film handling areas with air-conditioning, even if other sections of the building are not so equipped. Filtered air will help keep materials and equipment clean.

Mounted Pictures--Pictures should be stored in large flat shelved cabinets and have an environment of conditioned air.

Miscellaneous Other Materials--Most other materials can be stored on shelves or racks. No matter what type of storage facilities are used they must be conducive to neatness and easy accessibility (24:8-10).

"Closed shelving is needed for materials and equipment that are little used or need special protection. For materials that are frequently used, open shelving should be provided. It is more accessible and more conducive to good housekeeping" (18:30). Adjustable shelving will help increase the flexibility of the storage area. Flammable and

volatile liquids should be stored in fire resistant areas.

The bulk of the equipment and materials needed for classroom use in any building should be assigned to that building permanently (or temporarily if the use will be over a short span of time). Trucking or moving equipment and materials from building to building is costly in wear and tear on materials and equipment and in time consumed. Adequate storage facilities for audiovisual equipment should be located in each and every classroom building and instructional unit (21:205).

In buildings with more than one floor, elevators or ramps should be provided so that books, materials, and equipment can be transported easily. Floors and entryways through which carts must pass should be free of obstruction. Kickplates and jamb protection should be provided where equipment must be moved through doors (18:12).

Two important points must prevail when storage for materials is planned:

1. The materials must be well protected.
2. They must be accessible.

Ford states that " . . . any facility planned now for use for the next 20 to 40 years must be so constructed that it could accommodate instructional aids and resources currently available and at the same time provide facilities to accommodate our best predictions of the future" (22:524). All storage facilities planned today must be adequate for

the institution ten--twenty--or forty years from now.

Equipment storage. Many of the currently available aids to learning require the use of machines--projectors, receivers, playback devices, teaching machines, etc., and these machines are generally moved from area to area. Storage spaces for equipment will be necessary for the safekeeping when not in use, just as adequate transportation methods are needed to move equipment from station to station. Many pieces of audiovisual equipment are heavy, expensive and cumbersome. As was indicated in the previous section, elevators, ramps, etc., should be provided in any building that does not have its facilities on ground level. Movement of equipment can best be accomplished by the use of equipment carts, trucks, elevators, etc. When it becomes necessary to move equipment from building to building there should be roadways that could be used by motor vehicles.

When storage spaces for equipment are discussed it is advisable to consider the physical relationship of the resource center to the rest of the educational plant. The materials resource center will be used as a distribution point for equipment and materials to all of the community college. Equipment must be stored in both the resource center and the classroom buildings. If equipment is to be fully utilized it must be easily accessible to both students

and staff.

The resource center, as the distribution center for learning materials, must have certain physical relationships to the rest of the educational plant. Relationship to other facilities includes a major premise that the (resource) unit be centrally located for use by both the school and community. Other factors are:

1. Nearness to the central planning unit
2. Convenient delivery of materials
3. Ease of access to the general book storage and instructional materials storage
4. Reasonably quiet location (20:102).

Instructional materials production. Many of the unique teaching aids desired by instructors are not available commercially prepared; thus it may be necessary to locally produce these items. Instructors may design their own instructional materials and these may be produced by the trained staff in the local production unit.

The materials production area:

> . . . should provide for reproduction of printed materials and for the construction of teaching materials such as recordings, exhibits, charts, slides, posters, models, overhead transparencies, and programmed learning sequences for teaching machines. If a TV studio is included in the center, the production area should also serve its needs (18:17).

Production areas should be equipped with the following facilities:

1. Photographic darkroom designed for production and for the instruction of a class of 20 students

2. Electrical circuits to carry the heavy current drain of print dryer, drymount press, duplicator equipment, small power tools, etc.
3. Work counters, sinks, layout tables and desk space
4. Storage space for construction materials (paper, wood, plastic, metal, etc.)
5. Cabinets for the storage of small hand tools
6. Sinks with hot and cold running water
7. Duplicating facilities (mimeograph, multilith).

The graphic production area is an important part of the materials resource center in that it can supply "custom-made" devices that can be used to guide learning. Provision of space for the production of graphic materials is necessary if all of the new media devices are to be fully utilized. A minimum graphic production area of at least 240 square feet will be needed to serve the needs of the full-time production unit. A small projection room next to the graphic area will serve many useful purposes (21:276-277).

Some advantages of a local production unit are:

1. Current and up-to-date content
2. Flexibility allowed the institution
3. Teachers become more involved in teaching--teacher-made materials may receive more effective use.
4. Teaching aids can be tailored to each class.

A properly organized, planned and directed production unit can become an important asset to the total instructional program. When teachers are able to have a part in the design and production of learning, they will generally utilize these aids effectively. Students who have the

opportunity to produce aids may use this opportunity to visually construct and grasp the abstract material they have assimilated--in some cases the aids produced by students may be used by the instructor or they may be used by other students.

The photographic darkroom will be one of the very important work areas in the production unit. A large number of instructional materials are produced by a photochemical process. Following is a listing of fifteen points on the design and construction of a photographic darkroom. These points are reviewed from the Eastman Kodak Company publication, Darkroom Design and Construction.

1. If space permits, it is advisable to have at least two darkrooms--one for film processing and one for printing operations.
2. If the volume of color processing is sizable a special color darkroom would be considered because of the specialized equipment and extra critical environment needed.
3. A film loading and storage room is an advantage (it is advisable to store photosensitized materials under refrigeration).
4. The size of the darkroom depends on the use to which the room is to be put. The minimum size for any professional, industrial, or photomechanical darkroom is usually considered to be six by eight feet. If equipment, such as a darkroom-type camera, is installed, this minimum should be increased to about eight by ten feet.
5. The entrance to the darkroom must be of the type to prevent any light from entering. The type of entrance is best determined by the number of people that will be using the darkroom. The single door, light lock, or labyrinth should be designed for the entrance.

6. Wall covering is important in a darkroom. Ceiling, walls and woodwork that are never in contact with chemical solutions need no special attention. Wall surfaces that may be in contact with chemicals must be resistant to these chemicals. Chemical resistive paints, varnishes and lacquers are available. Structural glass can be used in wood jointed areas. Ceramic or chemical resistant plastic tile may be used.
7. The ideal floor covering should have these qualities: resistance to corrosive substances, resistance to staining, watertight, durability, freedom from slipperiness, resiliency for foot comfort and a suitable color. It is impossible to find floor coverings with all of these characteristics. The following types of floor coverings stand out as desirable for use in the darkroom: ceramic tile; composition tiles (hard rubber and plastic, for example); terrazzo (polished surface can be slippery, thus an aggregate of non-skid material must be included); and mastic (the least desirable material that could be acceptable).
8. Electrical wiring and equipment in the darkroom must conform to the regulations of the National Board of Fire Underwriters in order to protect the worker from electrical injury. All electrical circuits should be designed for 30-ampere loads. Film dryers, drymount presses, print dryers, etc., all constitute large power drains. Electrical circuits should be provided with reset-type circuit breakers and these circuit breakers should be easily accessible to the lab. All equipment should have the capability of being grounded. Convenience outlets should be located in the walls at waist level and outlets should be supplied for the major equipment locations. A red signal light should be located near the door outside the processing room. This signal light should be controlled by the safelight switch so that when the safelight is on the signal light will be on--in the film room a separate switch will be necessary because, generally, no safelights will be used. Safelights in the printing room should be provided on the basis of one for each five linear feet of bench or work area. They should be four feet above the work area and 15-watt bulbs should be used. Constant-voltage controllers for printing devices will minimize the effects of random voltage fluctuations.

9. Darkrooms should have as high a degree of illumination as is consistent with the safety of the types of materials being processed. General illumination is needed over the entire darkroom. Local illumination is needed, in addition to general illumination, in order to provide sufficient light at strategic points. (For information on the specific color and amount of light that can be used with various materials consult the manufacturer.)
10. Satisfactory ventilation of any darkroom is more complex than the ventilation of a room for comfort only. Incoming air for the darkroom should be filtered to minimize dust. Air should be changed in the darkroom six to ten times an hour. Air should be pumped in rather than out. A definite pattern of air flow should be planned so that fresh air is brought in at the "dry end" of the darkroom and exhausted from the "wet end." Drying facilities should not be exhausted into the room.
11. Plumbing installation is most economical and efficient when all sinks and drains are located along outer walls of the darkroom area. Long runs of uninsulated exposed water supply pipes should be avoided. Pipes supplying water to the sink should be placed to allow a clearance of at least 15 inches between the sink bottom and the faucets. The use of water filters provides inexpensive insurance against ruined negatives and prints because of dirt in the water. The globe-type valve should be used in water supply lines. Sinks and drain lines must be resistive to chemicals and they must be adequate to handle the flow expected.
12. Processing sinks need to be designed of material that will not be harmed by the processing chemicals and can be easily cleaned. Sinks should be located in a completely accessible location. They need drain facilities, running hot and cold water and water temperature control. Materials suitable for sinks are: stainless steel, lead-lined wood, stoneware, wood that has been made watertight, stone and Fiberglas.
13. It is necessary to have a controlled temperature of the water used in the darkroom. Mixing valves must be included in the water supply system.
14. The dry bench is where sensitized goods are handled and stored. It should be located on the dry side of the room. The length of the bench depends on

the volume of work and the space available. In a film-processing room, the suggested minimum length is four feet. In the printing room, there should be space to accommodate all of the enlargers and contact printers, plus sufficient working space for handling the printing paper. The proper height of the work bench is about three feet. The depth should be about twenty-four inches. Adequate storage space needs to be provided in the dry work area. Bench tops should be chemically inert, watertight and fairly resistant to abrasion. The color of the bench top should be chosen with the thought that objects will have to be seen under safelight illumination and they need to contrast with the bench top.

15. It is necessary for general storage to be provided. Above the benches, wall shelves or cupboards provide convenient storage space. The bottoms of these units should be at least two feet above the bench top. Shelves should be about ten or twelve inches wide (17:2-39).

The non-darkroom areas of the production center will need adequate electrical and plumbing facilities. Ventilation will also be very important in the area for the removal of odors from production projects (paint, diazo chemicals, etc.). Lighting in this area must be at a high level because of the large amount of close work being done. Air conditioning should possibly be considered because of the large amount of heat-producing equipment in operation. Storage spaces must be provided for materials and equipment.

All fixed equipment used in the production center should be specified by the architect. This fixed equipment would include cabinets, plumbing fixtures, lab desks or benches, light fixtures, etc.

Assuming that the local production unit will be

responsible for the production of audio materials a sound-proof recording studio would be an asset. If the resource center houses radio facilities, major recording tasks could be taken to the radio section.

Materials and equipment distribution. The resource center serves a passive role in that it will be a depository for a number of different types of aids to learning. When the aids stored in the resource center are needed in a classroom it must be possible to have these aids delivered to the classroom. Delivery will be by truck, hand cart or just carrying by hand. The person doing the delivery may be a member of the resource center staff or the person wanting the aid may take it with him. In either case it is necessary for the equipment and materials to be available.

In order for people to be able to discover what materials and equipment are available there must be some sort of materials and equipment listing. Possibly this listing could be in the standard library card catalog or it may be a separate listing.

The "nerve center" of any instructional materials resource center will be the central catalog. Every source of information available through the center should be listed in the central catalog. Perhaps the ordering and locating of materials by the user could be expedited by a color coding

system within the catalog that would let the user know at a glance by what media the information would be presented (4:603).

Orders will be taken by telephone or the user may come to the resource center. The audiovisual center needs an outer office or reception area where a clerk can take material and equipment orders and make deliveries of needed equipment and materials. Erickson indicates that the outer office or reception area should have facilities for "just looking" over catalogs of equipment and materials and instructional handbooks. For the sake of control it would be best to have the reception area attractively fenced off, with a gate leading to offices and technical operating spaces (21:269-270).

The layout of distribution spaces is very closely related to the areas where equipment and materials are stored. Distribution areas should be arranged so that they will fit into the natural flow pattern of work.

A loading dock should be provided for receiving and shipping large amounts of materials and for heavy equipment. Equipment that is heavy and bulky should, as much as possible, be moved on mobile carts. If repair and service facilities are maintained they should be close to the equipment check-in and inspection center.

It is important to consider the relationship of the center to the rest of the physical plant. Routes for delivery and accessibility to delivery points are important considerations when planning distribution facilities. Also, it is necessary to locate the parts of the center that produce distracting noise in such a way that they will not provide distractions to the portion of the resource center that is used for quiet study (20:102).

Preview area. Both students and instructors may have reason to use these facilities. These special areas may be designed and equipped to allow the auditioning of all types of projected and audio materials. These preview or auditioning spaces:

1. Should be designed for use by small groups only.
2. Should be well ventilated and have independent temperature control.
3. Should be soundproof or separated from study and instructional areas.
4. Should have double electrical outlets or continuous plug-in strip on each wall.
5. May be equipped with two or more screens and projectors, with earphones provided to enable simultaneous previewing of two or more films.
6. Should have dimmer light control to permit note-taking while films are being shown.
7. Should have no windows.
8. Should be located near projection equipment storage area.
9. Should be acoustically treated to prevent excessive reverberation.
10. Should have quiet, durable floor (rubber tile or cork is recommended) (18:15).

Erickson indicates that:

1. Small preview rooms are urgent--two to four of these rooms with about 36 square feet each should be located where sound emanating from the rooms will not distract other people.
2. A projection room for ten to fourteen people can serve many purposes in a resource center.
3. All preview rooms should be located close to audiovisual equipment and staff.
4. Facilities for earphone auditioning of audio materials should be provided (21:275-276).

It is possible that the preview facilities can be provided in the reception area. Equipment can be placed on tables: filmstrip preview devices, slide viewers, audio devices with earphones, projectors using rear projection screens and earphones and hand operated silent film viewers. (The reception area of the audiovisual materials center at Central Washington State College is arranged in this manner and it appears to be very adequate.)

Audio practice lab. "The term 'language laboratory' is used," according to DeBernardis, "to describe any one of a number of rooms and spaces in public schools and colleges where recording and playback equipment is used in the teaching of speech, literature, foreign language, and business education" (18:35). Language laboratories can take many forms. It is often advisable to have an installation in the learning resource center to provide an opportunity for additional practice at times when the language class is not available.

Library installations may be just like the regular language classroom or they may vary extremely. In some library installations the program will be sent to each student booth from the control room--the student selects the program desired and "tunes it in." In other cases, the student will have a taped copy of the material to be practiced and take it to his tape recorder, or to his dual track audio-active training tape recorder and then return it to the circulation desk when finished (26:4-5).

The audio lab will be used by a wide variety of people. This facility will be used by more than the foreign language or speech students; it will find use by the secretarial science students, music students listening to pre-recorded programs and a variety of others using recorded material such as lectures, recorded dramatic productions, radio presentations, etc.

Generally, the facilities needed in the electronic practice lab located in a library will be:

1. Listening stations
2. Listen - respond stations
3. Listen - respond - record check stations
4. Listen - respond - record testing stations.

These facilities can be simple or elaborate depending on the needs of the language program. Any facilities that are installed must be flexible so that modifications and possible expansion can be carried on.

The audio practice lab should be located in an area that will not be disturbed by the speaking taking place in the audio lab. The lab, or practice room, should be located in an area where outside noise will not be distracting.

If the practice room contains any amount of electrical equipment it is necessary to have the room well ventilated because of the heat produced. Windows do not provide a good source of ventilation because of the noise they allow to enter and they may provide a considerable distraction. The backs of the students should be to the main entrance of the room. Supervision of the practice room must be provided for.

Generally, original recordings will not be made in the practice lab in the materials center. The library will need a well developed program source to feed all of the audio receiving stations. Tape players, disc players, and radios are the most common program sources. Audio-active tape decks will often be used for language and speech practice.

A. S. Hayes, in his book, Language Laboratory Facilities, feels that, "The one technically-based commodity which the chosen system must supply, and continue to supply, is the high-quality recording and reproduction of speech" (26:44). Some of the technical qualities that should be

sought in the audio equipment are listed below:

1. Audio Frequency Response--Any statement of required frequency response would be meaningless without a statement of any intensity variation over the prescribed frequency range. Human hearing has a frequency reception range of approximately 16 cps (cycles per second) to 16,000 cps. On any equipment selected the frequency should have a "wide band" response with not more than a seven to ten decibel plus or minus fluctuation from a reference point of 1,000 cps. Generally, the wider the frequency response (not over 10 to 30,000 cps) and the less the intensity fluctuation the better the reproduction (26:48-49).
2. Harmonic Distortion--These unwanted harmonics induced by the system need to be on a very low level. Generally, if harmonic distortion is low, intermodulation will be low. It is advisable for an audio-equipment specialist to write the specifications in this area (26:49).
3. Wow and Flutter--These variations in the speed of the transport system will cause the pitch of the recorded signal to vary or change. Wow and flutter should be at as low a level as possible (reported, generally, in percentage figures) (26:50).
4. Noise--Noise may be caused by any component in the total system. When considering a total laboratory installation keep in mind the electrical as well as mechanical noise. All recording and reproducing systems have some noise in them. Electrical noise in amplifiers is measured as signal-to-noise ratio stated in decibels below a reference power level. The larger the decibel number, the better the signal-to-noise ratio (26:50).
5. Operability--Any equipment selected needs to be easy to operate and it must be reliable in its operation. When repairs are needed they should be easily facilitated. Safety of the user must be considered whenever any electrical or mechanical equipment is discussed.

Radio facilities. "With the educational TV commanding attention of educators, interest in educational radio appears to have waned. Nonetheless, many school systems

continue to maintain radio stations and are using radio effectively to supplement their programs of instruction" (18:55).

The basic radio station will have the following spaces:

1. Studio broadcasting room--Space to house a piano, desk and chairs to seat two to eight persons. Area and equipment of studio will depend on the type of programs planned.
2. Control room--Space to house control console, a minimum of two turntables, two tape players, a record storage rack and "equipment (monitor) rack," a utility table, large record and tape storage cabinet and a swivel chair for the person manning the console. Where the control room is separated from, but adjoining the studio, the wall joining the control room and studio should be soundproof and have a glass panel through which the control operator can view the studio and be seen from it.
3. Work and storage area--Space for making minor equipment repairs and for storing parts. Space for this purpose can be provided in the control room in small stations (18:55).

The following material is derived from pages 56 and 57 of the manual, Planning Schools for New Media:

A. The studio broadcasting room should:
   1. Be separated from hall and outside noises by another room or by a sound lock.
   2. Have a generally rectangular shape.
   3. Be planned to avoid placing large plane, sound-reflecting surfaces opposite and parallel to each other.
   4. Have floor and floor covering that will minimize noise. Where shape of studio is rectangular and no sound diffusing elements were used, acoustical treatment should be about equally applied on all walls and ceiling. Minor surfaces and coves need not be acoustically treated.

5. Heating and ventilating systems should be non-noise producing.
6. Have adequate supply storage nearby.
7. Be provided inputs for at least four microphones. It is advisable to provide for more inputs than will initially be needed.
8. Be provided with double electrical outlets on each wall.
9. Be provided basic equipment including clock, monitor speaker, table microphone, at least one microphone on suspension boom or floor stand, small table and minimum of two chairs.

B. The control room should:
1. Be planned so that turntables, tape machines, control console and record rack are all within easy reach of the operator.
2. Have the equipment rack located with reference to the control console so that frequency and modulation monitor meters may be read without leaving the operating position.
3. Have a large clock with sweep-second hand mounted on the wall behind the console.
4. Have storage record racks conveniently accessible. A small utility storage rack may be located just to the rear of the operator for daily program material.
5. Have wiring conduits accessible for repair or expansion.
6. If separated from studio by wall, be provided with independent heating and ventilating.
7. If separated from studio by wall, be provided with wall clock and communication with studio.
8. Have wiring and power needs planned by a qualified electrical engineer.

C. The work and storage area should:
1. Have space for work bench for making minor equipment repairs.
2. Have storage space for equipment parts.
3. Have adequate ventilation and heat control.
4. The transmitter and tower for the school radio station should be planned with the technical assistance of an electrical engineer and technicians from corporations producing this kind of equipment (18:56-57).

Television facilities. Instructional television can be utilized in many classroom situations. Nothing says that

a television system must be a large, expensive and complicated system to be effective. While a large, complex instructional television system has some instructional advantages, such a system is not a necessity to perform many instructional tasks. The small, less elaborate system helps prevent the television programs from becoming the central media system in the total instructional pattern (25:304). The goal of any educational undertaking is the assimilation and use of information presented by some instructional system. The student and the effectiveness of his learning is the most important thing in the educational process.

Haney describes a "compact TV" system (that is currently in operation at the United States Air Force Academy) that " . . . reduces the requirements for equipment, space, and personnel to the minimum necessary to accomplish the task, and yet provides for sound utilization of the characteristics and resources of the television medium . . . . The concept of compact television production centers on the individual instructor and considers just what he wants television to do for him in presenting his lessons to his students" (25:304).

The compact television system under discussion is a closed-circuit system that " . . . provides at moderate cost and low overhead an alternative means of presenting televised instruction . . . . Compact production reduces the common

break-even point at which television instruction becomes as economical as conventional classroom instruction from the 200-student figure reported by most schools using the standard pattern of broadcast production down to 48, or the equivalent of three classroom loads" (25:307). Haney goes on to report that the United States Air Force Academy system cost $35,000 for the studio and nine television classrooms, not including television receivers in the classrooms (25:307).

The "compact TV" system operates around the instructor. Everything about the system is very simple--visuals are simple and the equipment is operated by the instructor (not a technically-trained television teacher). In using this type of system it is very easy to employ the techniques of programmed instruction. Student response systems can be used with instructional television in an attempt to gather and evaluate the responses made by the students.

Students involved in television lessons where there was feedback to the instructor expressed that they felt that they were able to operate and learn very adequately as compared to the conventional classroom. No significant difference in performance was found in classes using two-way communication system as compared with television classes without feedback (11:68).

> In an experiment conducted at Penn State University in 1956-57 comparative cost estimates were made of instruction by TV and by conventional methods. It was found that TV classes in elementary psychology, accounting, air science, and sociology were presented at a cost of $52,000, whereas conventional instruction previously cost $92,000 (64:62).

Television facilities, if they are planned, must consider the answers to the following questions:

1. Is the TV teacher to be used for direct instruction, using the classroom teacher for discussions, testing, supervised study, and personal assistance?
2. Is TV to be used for lectures and demonstrations, with laboratory work supervised by classroom teachers but coordinated with the TV instruction?
3. Is TV to be used for "enrichment" in such subjects as art, music, drama, literature?
4. Is TV to play a major or minor role in the school in any or all of its applications?
5. Is TV to be available as an instructional aid in all subject areas or is its use to be limited to specific subjects or courses?
6. Is TV to be used for administration and in-service education (18:59)?

Any television production could include the following spaces:

1. The teaching studio
2. The control room
3. Film broadcasting studio
4. Graphic arts preparation area
5. Rehearsal room
6. Film workshop
7. Storage facilities.

The following information on educational television facilities is obtained from the manual, Planning Schools for New Media, pages 60-65.

The teaching studio:

1. Should be separated from hall and outside noises by another room or a sound lock.
2. Should provide sufficient space for free movement of the TV teacher using props, charts and magnetic chalkboard, as well as space for the proper manning and movement of TV equipment at suitable ranges. Normally a minimum of 1200 square feet will be required. (If future use of video-tape equipment is contemplated, additional space which is sound isolated from studio and control room should be provided.)
3. Should provide space for two or three sets to permit preparations ahead of time.
4. Should be equipped with a set of wide doors (sound-proof) through which props may be moved.
5. Should, if feasible, be accessible from driveway so that machinery and equipment may be driven into the studio.
6. Should be provided with a wall with large windows separating studio from control room.
7. Should be provided with overhead and supplemental lighting and a lighting switchboard on recommendation of qualified lighting engineer.
8. Should be provided with grid system, equipped with continuous bus ducts for lighting.
9. Should have wiring that is accessible and installed so that changes and additions may easily be made.
10. Should have a heating and ventilating system that will insure uniform temperatures under varying conditions.
11. Should have floors that are level, quiet and free from obstructions. Experience has shown concrete floors to be far more satisfactory than wooden floors.
12. Should have no windows.
13. Insofar as possible, equipment such as desks, magnetic chalkboard and chart stands should be portable to insure flexible use of studio space. Water, gas, air and electricity should be provided for demonstrations.
14. Should have sufficient ceiling height to allow for lights and supporting grid. Fourteen feet is recommended.
15. If only one studio is planned, it should be fitted for flexible, not specialized uses, and should be arranged and equipped for continuous programming.

The control room should:

1. Be separated from the teaching studio by a wall with a glass panel to permit full viewing of the studio.
2. Be provided with independent heating and ventilating controls. Proper ventilation and heat control is highly essential in this small room because of the intense heat produced by electronic equipment.
3. Provide space for housing and manning the monitoring, switching, sound control and camera control equipment, and for housing the power supply and other equipment required for the particular system being installed.
4. Be connected by a quiet-operating, soundproof door with the teaching studio.
5. Have accessible raceways in floor for wiring.
6. Be provided with storage for tapes, records, earphones.
7. Be isolated, or insulated, from noise producing areas.

The film broadcast studio is used to supplement the live television programs with motion pictures, slides, opaques and possibly, videotape reproduction. The film broadcasting studio should:

1. Be provided space for the installation of a film camera, 16mm film projector, 35mm slide projector and a multiplexer. A minimum of 12x15 feet is suggested for this equipment.
2. Be equipped with storage racks, shelves and files for motion picture films, filmstrips, slides, charts, photographs, etc. Storage and equipment may, if desired, be provided in separate room between film broadcast studio and film preview room.
3. Be provided a table with film editing, repairing and splicing equipment.
4. Be adjacent to a film preview room, and connected with this room by a door.
5. Be located as near as possible to the teaching studio. Preferably, the studio should be located near the graphics shop.

Assuming the resource center has a fully equipped audiovisual production laboratory, it would be possible to use the existing facility for most of the graphic arts production. This makes it necessary for the television center to be located in close proximity to the production unit.

As with the graphic arts production unit, it should be possible to have the same production unit serve for the film workshop area.

Properties storage should be:

1. Adequate to accommodate a reserve of sets and properties. Three hundred square feet is suggested.
2. Provided flexible and movable shelves and cabinets.
3. Provided large double or sliding doors. Doors should be easy to lock in "open" position.
4. Located as near as possible to the teaching studio.
5. Free of obstructions and installations that interfere with the free and convenient movement of properties, dollies and hand trucks.
6. Located near the graphics shop (18:60-65).

Printed materials section. Printing is still considered to be the most effective way of recording the knowledge of our expanding society. Most educational undertakings will involve the use of books or other printed materials.

One of the major portions of the resource center will be the book storage or printed materials section. Possibly, this portion of the resource center could be compared with what we consider the traditionally oriented library. Books,

magazines, journals, maps, mounted prints, etc., will be found and used in this portion of the center.

All of the material in this area needs to be arranged so that it is accessible, well protected and easily circulated. A filing system for all materials needs to be adapted and a circulatory procedure put into effect. The materials need to be arranged in a logical order to facilitate their easy access.

Catalog listings of all printed materials, as well as of all materials, will be very important to the availability of instructional devices. Generally, the cross-filed card catalog will inform the user of the materials collection available (4:603).

Community colleges, as a community service institution, may have a library that is available for public use. In designing the instructional materials center it is important that total accessibility be considered.

Storage areas. All shelves for storage of books and other printed material should have the following features:

1. Strength--large numbers of books provide significant weight.
2. Shelves should be flexible--to accommodate different size materials.
3. Stacks should be spaced far enough apart to allow passage between columns.
4. Lighting should be sufficient to make it possible to work in the stack area without causing visual discomfort.

5. Stacks should not be so high that the top shelf is out of easy reach.
6. It should be easy to reshelve materials.
7. Most stacks should be open to provide for browsing and easy access.
8. Closed shelves should be provided for materials on limited circulation.

Reading rooms. The entrance to the materials center serves as a focal point for all of the center's functions. The atmosphere of the resource center should suggest friendliness, informality and invitation to learning. The reading or book section of the library should include the following sections: (1) entrance and exit; (2) recreational reading; (3) small group conversation areas; (4) periodicals; (5) circulation desk; (6) card catalog; and (7) the display area. One major portion of the book section of the center will be the reference and research area. This part of the center should be next to the browsing and large reading room area. Reference collections for all areas will be housed here. Flexibility for this area can be maintained with the use of low movable bookcases, planters and room dividers. Adequate study space needs to be found in this area (22:524-526).

Wattenbarger indicates that a large reading room needs to be provided at a community college because of the large number of students that, because of commuting, must make use of the resource center facilities during the school

day or on a limited basis. Also, when planning the reading areas it is advisable to consider future expansion of the college facilities and the increased demands that may be placed on the resource center facilities (67:542-543).

Lighting and heating in these areas should be comparable to those found in the average classroom.

All major facilities of the resource center need to be easily accessible to the student in the general reading room. Offices of resource center staff members should be designed in such a way that makes it possible for the student to seek assistance from trained personnel when it is needed.

Lounges. As in the classroom areas, lounges should be available for student relaxation and informal meetings. The resource center will serve as the center of the student's activity on the campus. More time will probably be spent in the library than any other area on campus. Many students will desire to make the resource center their center of operation for their college day.

Located adjacent to the lounge areas should be lavatory facilities, coat storage and other personal service areas.

Furniture in lounge areas should be well designed and comfortable. Arrangement of the furniture should be such as

to allow discussion and informal study.

Study spaces. Individual and group study areas are necessary in the materials center. Four basic study areas are necessary in the materials center. These four areas are: (1) individual study space, (2) small group conference space, (3) large group work area and (4) informal study or lounge area.

Large reading rooms should be equipped with reading tables as well as some individual study carrels. Located in close proximity to the book storage area and the reading room should be a number of private study carrels and a few small group conference rooms. Larger meeting rooms (and rooms containing special materials collections) should be accessible to the central portion of the building. Audio practice labs and preview or auditioning facilities can also be employed as study areas.

Office space for the center's staff. Office space will be one of the important areas of the resource center. Coordination of the activities of the resource center should be directed from a suite of well planned offices. The offices should be designed so the people in them will be accessible to both students and staff. The atmosphere of the resource center must be such that it encourages cooperation--a feeling of belonging and a desire for

cooperation.

Private offices should be available for each of the specialists on the resource center staff. It might be advisable for each subject matter department to have a small, semi-private office or work space in the materials center (10:57).

Each office should have adequate heating and ventilation, light and space. The size of the offices and their layout will depend on what the person in the office will be responsible for doing. Each office should afford privacy. Each office should also have an outer office where a secretary can carry on her duties, assuming that one is needed.

A reception area, with a comfortable, relaxing atmosphere, should be adjacent to the office space. Each section of the resource center should have its separate office space--traditional library, audiovisual section, television-radio and production area.

Offices for special service personnel, such as director of the materials production unit, television director, film librarian, or the materials distribution supervisor, should be located as close as practical to their service area.

Environment control. As was mentioned in the section

on materials storage, it is often advisable to provide a conditioned atmosphere, thus partially controlling environment for materials storage. Areas that produce heat, such as radio and television control rooms, language laboratory, etc., should be provided with some means of maintaining a comfortable temperature. Photographic darkrooms, if it is possible, should be provided with very sensitive temperature control equipment. The staff of the resource center might possibly be more productive in an environment controlled by air conditioning. " . . . industry and business have concluded, on the basis of research findings, that performance is affected by thermal environment both above and below the so-called normal 'comfort zone'" (2:118).

The community college will be established as a service-centered institution to serve the community. The probability is high that the use of the resource center during the entire year by the public, students and college faculty, will be forthcoming. If this possibility exists, it may be wise to consider <u>total</u> air conditioning (2:118-119). The reference to total air conditioning can be explained by mentioning the environmental factors to be controlled: warmth, coolness, humidity, rate of circulation and air purification and filtering.

The resource center, being the center of the academic activities of the college, will receive extensive use.

Possibly, the reading room and library research facilities will be more effectively utilized if they are provided with total air conditioning.

Visual activity will be on a high level in the resource center. The quantity and quality of light in the center must be well planned. It is advisable that the technical services of an illuminating engineer be utilized during the planning of the resource center.

Caudill indicates that the recommended level of light necessary to carry on the activities of the normal classroom is from 20 to 40 foot-candles (12:5).

In the large reading rooms and book stack areas it will be necessary to provide lighting adequate to make visual comfort possible while reading, writing or other close visual activities. In an area such as the book stacks, light distribution may be a problem.

Throughout the audiovisual section of the resource center adequate light for exacting, close work should be provided. The audiovisual section should be provided with 35 to 45 foot-candles of light. It must be remembered that special lighting requirements will be found in the darkroom and the television studio. These areas need to be considered separately when the illumination facilities are planned.

Areas designed for viewing projected material (preview rooms) should be provided total light control.

Incandescent lights which can be dimmed might be more satisfactory than switched fluorescents for the preview rooms. If adequate building ventilation is provided, windows should not be necessary in these small preview rooms.

Physical relationship of the instructional materials center to the total campus. If the resource center is to be considered as one of the major areas of the community college campus it should be located in an area that will make it directly accessible from all points on campus.

" . . . the learning and resources center might well be surrounded by quiet, landscaped areas that are compatible with activities within the center. Outdoor lecture areas could be provided, too. Pedestrian and vehicular traffic should be routed away from this portion of the site" (31:76). It is very important to consider and plan the traffic flow patterns around the campus. Walkways and streets on the campus should be well lit at night because of the possible heavy night uses. Automobile parking facilities should be provided within a reasonable distance to the resource center (67:542-543).

Throughout the entire campus it is very important that the many varied tools of instruction--both the simple and the complex--should be " . . . prominent only to the

extent that they enhance the learning process. Closed doors, counter barriers, vast corridors, expansive spaces, standing in line, things which make the individual feel small and insignificant would seem to have an inverse psychological effect on his ability to learn" (59:1). The student, his learning and development, are paramount when functions of a community college are discussed. The need for an adequate instructional materials center, oriented towards a service-centered operation, is urgent when we consider that searching and learning are the prime academic functions of the community college. The teacher and learner will rely heavily on the materials center to provide services and materials necessary to aid and promote many varying learning activities. Operating within the philosophy of the community college the instructional materials center can become the learning center for students, faculty and community.

CHAPTER V

SUMMARY

I. SUMMARY OF THE STUDY

A paper prepared by J. L. Trump, "Changing Concepts of Instruction and the School Library as a Materials Center," states clearly that the instructional materials program of any educational institution in effect will serve as an embodiment of an operating philosophy about learning (35:1). It is necessary that the philosophy of a community college library be organized and implemented to relate with the curricular philosophy of the total institution.

In retrospect. Chapter I of this paper provides an overview of the community junior college as an educational institution. An attempt was made to review the historical and developmental aspects of the community college. Literature concerning curricular organization and services offered by community colleges was discussed.

A statement of the problem and an explanation of the scope for this study are the most significant portions of this first chapter. The purpose of this study was:

1. To review the physical requirements and facilities of instructional materials centers
2. To review the student station facilities
3. To review the instructional station facilities

4. To relate instructional materials and their utilization to the community college curriculum
5. To review the data needed to write educational specifications.

Reviews of available literature, personal contacts with individuals in the media field and letters to selected individuals and commercial organizations proved to be the basic scope of the foregoing study. It was attempted to make the information included in this study as current and complete as is practical in a study of this type.

In order to gain an understanding of the role of community colleges an exploration of curricular programs is offered in Chapter II. An in-depth study of transfer, terminal, vocational-technical, guidance, cultural activities and community service programs was made so it would be possible to see how instructional resources could be used by community college students and instructors. It was considered essential to have an understanding of the instructional program within which the instructional media program would operate.

Chapter III deals with the designing and construction of the physical plant facilities for community colleges. An attempt was made to relate the philosophy of the community college, media utilization patterns and personal needs to a discussion of physical plant facilities. Chapter III is presented from an instructional media approach. Various

instructional configurations are presented through the discussion of instructional facilities. An attempt was made to explore the varying space arrangements, physical facilities and instructional techniques that could be utilized on a community college campus.

The instructional resource or materials center is studied in detail in Chapter IV. The IMC, as the materials center is commonly called, will be a very complex service unit within the college. Potentially, the IMC could become the instructional core or center of the college program. Data on physical requirements and possible IMC programs are discussed in this chapter.

The three phases of learning--discovery, independent study and explanation by others (35:2-3)--can be implemented by instructional materials centers. The IMC services must correlate with the curricular needs in order to meet teaching-learning demands.

Taylor states that:

> The instructional materials center begins when traditionally regarded library and audio-visual departments are combined. From this union should come not only the sum of what was previously available in two separate areas of the school, but also distinctly new services that result from centralization itself (60:45).

New educational techniques and related materials, together with changing curriculums, are constantly developing. These changes in techniques and curriculum necessitate

the maintenance of a program that is flexible. This will allow the beneficial changes or innovations to be incorporated into the community college program.

Suggestions for implementation. The information presented in the preceding chapters represents a thorough synthesis, within the scope of this project, of the data available on community college instructional materials programs and the physical plant facilities necessary to house such programs. Some major instructional configurations are discussed as they relate to the utilization of much that is termed the new media.

Information, as presented here, could be of value in the planning and organizing of instructional programs and facilities. As was stated in the first chapter this paper should be of value in determining physical plant requirements and operational patterns for an effective instructional materials program. It is felt that this paper could be of value to an educational specifications planning committee, person(s) planning community college facilities, designers of instructional materials programs, individuals desiring insight into the community college level instructional materials program and to persons interested in one criteria upon which a materials program could be evaluated against. Selected segments of this paper might be briefed and

presented separately as a printed review of specific phases of the materials program.

One observation of significance to users of this report--information in the instructional media area is rapidly changing at the present time. In an extremely short period of time it is possible for quantitative data and specific programs to become obsolete. For this reason it is suggested that the ideas and concepts presented in this paper be considered in as flexible a manner as possible--only information that is current or up-to-date and from reliable sources will be of value in planning physical facilities.

Suggestions for future study. The entire area of instructional media utilization, curricular organization, instructional patterns and physical plant facilities is receiving considerable attention throughout the educational spectrum. Community colleges are involved in a period in which their roles are being studied and defined and many new programs are being tried. During the time that this research project was under way a number of topics or problems that might profit from research and exploration became evident. These suggested problems, not listed in any order of importance, are:

1. Conduct a longitudinal study involving the establishment and development of an instructional media program. Study all variables of this program that might have a relationship to its success or failure.
2. Isolate all of the unique traits of the community college instructional materials program--traits that are not found in other higher education institutions.
3. Study and report on in-service programs offered to college instructional staffs in the area of media utilization. Study and try to define variables that are responsible for making a given in-service program successful.
4. Explore new and current innovations in physical plant facilities that are conducive to media utilization. Attempt to produce a set of physical plant criteria that describes a functional building.
5. Explore internship possibilities in the instructional technology or media area.
6. Study and report upon flexible instructional scheduling for community college programs.
7. Conduct a feasibility study of community college level curricular resource centers providing many instructional support services.
8. Explore the systems approach to college level instruction.
9. Design a community college instructional materials center plant. Involve all of the best features possible and then participate in a space utilization study and evaluation of the plant.
10. Study curricular programs on the community college level for the training of teacher aides or instructional assistants in the instructional media area.
11. Describe and attempt to isolate the variables that have a relationship to successful leadership of instructional materials programs on the college level. Attempt to isolate variables that make for successful leadership of instructional materials programs.

Communication is a necessary prerequisite to learning. Communication may be intra-personal or inter-personal. Regarding communication, Coffman indicates:

> I submit for your consideration the proposition that CREATIVE COMMUNICATION IS MAN'S FIRST AND GREATEST INVENTION. It is true that the lower animals have rudimentary instinctive communication techniques--mostly warnings, mating calls, and feeding invitations--but there is no evidence that any animal has ever achieved the ability to communicate the simplest of new concepts to any of his fellows, by any technique other than direct imitation (14:2).

As communication of ideas becomes more effective, understanding should become greater. More and more educators are attempting to design instructional configurations that will improve and enhance the communication of concepts, attitudes, factual information and experiences. The major function of the community college is its instructional program. The success of the instructional program will, by a great extent, be related to the resources for learning available and the physical plant facilities designed to house the learning activities. Resources and facilities need to lend themselves to learning activities and they must implement the total learning process--unless they have a positive relation to the role of the institution they have no justification for existence.

BIBLIOGRAPHY

1. Adams, Harlen Martin. The Junior College Library Program. Stanford, California: Stanford University Press, 1940.

2. American Association of School Administrators. Planning American School Buildings, Report of the AASA School Building Commission. Washington, D. C.: American Association of School Administrators, 1960.

3. Beck, A. L. "Planning Community College Facilities," Community College Research Symposium. Olympia, Washington: Washington State Department of Education, 1963. Pp. 144-151.

4. Beggs, David W., III. "Organization Follows Use . . . The Instructional Materials Center," Audiovisual Instruction, 9:602-604, November, 1964.

5. Beynon, John. Study Carrels: Design for Independent Study Space. Stanford, California: Western Regional Center of Educational Facilities Laboratories, Inc., Stanford School of Education, Stanford University, 1964.

6. Bogue, Jesse Parker. The Community College. New York: McGraw-Hill Book Company, Inc., 1950.

7. Bricks and Mortarboards. New York: Educational Facilities Laboratories, 1964.

8. Brown, James W. and James W. Thornton, Jr. College Teaching: Perspectives and Guidelines. New York: McGraw-Hill Book Company, Inc., 1963.

9. Brown, James W. and James W. Thornton, Jr. (eds.). New Media in Higher Education. Washington, D. C.: Association for Higher Education and Division of Audiovisual Instructional Service of the National Education Association, 1963.

10. Buehring, Leo E. "A School Where Walls Fold Away and Teachers Have Individual Offices," Nation's Schools, 68:53-61, November, 1961.

11. Cassirer, Henry R. Television Teaching Today. Place de Fonteroy, Paris 7, France: United Nations Educational, Scientific and Cultural Organization, 1960.

12. Caudill, William W. Toward Better School Design. New York: F. W. Dodge Corporation, 1954.

13. Chase, William W. Problems in Planning Urban School Facilities. Washington, D. C.: United States Department of Health, Education, and Welfare, Department of Education, 1964.

14. Coffman, Joe W. (President, Tecnifax Corporation). "The Role of Visual Communication." An address delivered to the 75th Anniversary Convention, Photographers' Association of America, Chicago, August 15, 1955.

15. Community College Research Symposium. Olympia, Washington: Washington State Department of Education, 1963.

16. Cooper, Shirley. "Using the New Leisure," National Elementary Principal, 36:9, February, 1957.

17. Darkroom Design and Construction, Second Edition, Sales and Service Publication K-13. Rochester 4, New York: Eastman Kodak Company, 1963.

18. DeBernardis, Amo, Victor W. Doherty, Errett Hummel and Charles W. Brubaker. Planning Schools for New Media. Portland, Oregon: Portland State College, 1961.

19. Dressel, Paul L. The Undergraduate Curriculum in Higher Education. Washington, D. C.: The Center for Applied Research in Education, Inc., 1963.

20. Engelhardt, N. L., N. L. Engelhardt, Jr. and Stanton Leggett. School Planning and Building Handbook. New York: F. W. Dodge Corporation, 1956.

21. Erickson, Carlton W. H. Administering Audio-Visual Services. New York: Macmillan, 1959.

22. Ford, Harry J. "The Instructional Resources Center," Audiovisual Instruction, 7:524-526, October, 1962.

23. Foundations for Effective Audio-Visual Projection, Kodak Pamphlet No. S-3. Rochester, New York: Eastman Kodak Company, Sales and Service Division, 1962.

24. Handling, Repair and Storage of 16mm Films, The, Pamphlet D-23. Rochester, New York: Eastman Kodak Company, Sales Service Division, n.d.

25. Haney, John B., Capt., U.S.A.F. "Compact Television for Local Instruction," Audiovisual Instruction, 8:304-307, May, 1963.

26. Hayes, Alfred S. Language Laboratory Facilities. Washington, D. C.: United States Department of Health, Education, and Welfare, 1963.

27. Henry, Nelson B. (ed.). The Public Junior College, The Fifty-fifth Yearbook of the National Society for the Study of Education, Part 1. Chicago: NSSE, 1956.

28. Herrick, John H., Ralph D. McLeary, Wilfred F. Clapp and Walter F. Bogner. From School Program to School Plant. New York: Henry Holt and Company, Inc., 1956.

29. Hillway, Tyrus. The American Two-Year College. New York: Harper and Brothers, Publishers, 1958.

30. Hoeglund, Harold A. "Let's Work on Curriculum," Junior College Journal, 31:437-441, April, 1961.

31. Kelsey, F. Lamar. "Building Today for Tomorrow's School Program," Nation's Schools, 69:73-80, May, 1962.

32. Lewis, Philip. "The Role of the Educational Communications Specialist," American School Board Journal, 143:16-17, December, 1961.

33. MacConnell, James D. Planning for School Buildings. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1957.

34. Macomber, F. Glenn and Laurence Siegel. Final Report of the Experimental Study in Instructional Procedures. Oxford, Ohio: Miami University, 1960.

35. Mahar, Mary Helen (ed.). The School Library as a Materials Center. Washington, D. C.: United States Department of Health, Education, and Welfare, Office of Education, 1963.

36. Marsh, Stewart. "Students at Dusk," Junior College Journal, 28:427-429, April, 1958.

37. McIntyre, Charles J. "The Impact of New Media on College Instruction," Journal of Higher Education, 34:85-91, February, 1963.

38. McLure, William P. "The Challenge of Vocational and Technical Education," Phi Delta Kappan, 43:212-217, February, 1962.

39. Medsker, Leland L. The Junior College: Progress and Prospect. New York: McGraw-Hill Book Company, Inc., 1960.

40. Miller, Harry L. Teaching and Learning in Adult Education. New York: The Macmillan Company, 1964.

41. Mitchell, Malcolm G. "What's Going On In the School Library?" Phi Delta Kappan, 45:44-47, October, 1963.

42. Morlan, John. "The Team Approach to Large-Group Instruction," Audiovisual Instruction, 9:520-523, October, 1964.

43. Morris, Edward M. "Junior College Night Classes," Junior College Journal, 30:79-82, October, 1959.

44. Morrison, D. G. "Planning Community Junior College Buildings," Higher Education (USDHEW), 14:57-59, December, 1957.

45. Morrison, D. Grant and Arnold C. Tjomsland. A Guide for Planning Community Junior Colleges in the State of Washington. Olympia, Washington: State of Washington, State Board of Education, 1957.

46. National Council on Schoolhouse Construction, Research Committee. Guide for Planning School Plants. Nashville, Tennessee: National Council for Schoolhouse Construction, 1958.

47. New Teaching Aids for the American Classroom. Stanford, California: Institute for Communication Research, Stanford University, 1960.

48. North Central Association of Colleges and Secondary Schools, The Subcommittee on Television of the Commission on Research and Service. The Uses of Television in Education. Chicago, Illinois: North Central Association, University of Chicago, 1961.

49. O'Connor, Olwyn. "A Statement of Philosophy and Purposes for an AV Department," Educational Screen and Audiovisual Guide, 40:488-489, September, 1961.

50. Odegaard, Charles E. "Community Colleges: Education or Higher Education?" Junior College Journal, 33:20-21, April, 1963.

51. Poore, Jeanette, "The Community College Student," Community College Research Symposium, Olympia, Washington: Washington State Department of Education, 1963. Pp. 1-16.

52. Rork, John B. and Leslie F. Robbins. Casebook on Campus Planning and Institutional Development. Washington, D. C.: United States Department of Health, Education, and Welfare, 1962.

53. Ruark, Henry C., Jr. "It's IMC for 1963," Educational Screen and Audiovisual Guide, 42:674-680, December, 1963.

54. Rufsvold, Margaret I. Audio-Visual School Library Service - A Handbook for Librarians. Chicago: American Library Association, 1949.

55. Smith, Edward P. "The Community College Library," Community College Research Symposium. Olympia, Washington: Washington State Department of Education, 1963. Pp. 35-44.

56. Strevell, Wallace H. and Arvid J. Burke. Administration of the School Building Program. New York: McGraw-Hill Book Company, Inc., 1959.

57. Sumption, Merle R. and Jack L. Landes. Planning Functional School Buildings. New York: Harper and Brothers, Publishers, 1957.

58. Tacoma Community College Planning: Community College Educational Specifications Committee. Tacoma, Washington: Tacoma Public Schools, September 17, 1963. (Mimeographed.)

59. Tacoma Community College Planning: Philosophical Basis for a Community College. Tacoma, Washington: Tacoma Public Schools, August 20, 1963. (Mimeographed.)

60. Taylor, Kenneth I. "Instructional Materials Center," Nation's Schools, 66:45-50, December, 1960.

61. Tead, Ordway. College Teaching and College Learning. New Haven: Yale University Press, 1949.

62. Thornton, James W., Jr. The Community Junior College. New York: John Wiley and Sons, Inc., 1960.

63. To Build or Not to Build. New York: Educational Facilities Laboratories, n.d.

64. "TV vs Conventional Instructional Costs," Higher Education, 14:62, December, 1957.

65. Tyler, Ralph W. "The Teaching Obligation," Junior College Journal, 30:525-533, May, 1960.

66. Washcoe, W. C., Lt. Col. "Visual Communication Designed for Rapid Tempo Learning," Audiovisual Instruction, 8:208-213, April, 1963.

67. Wattenbarger, James L. "Planning Facilities for Junior Colleges," Junior College Journal, 30:539-543, May, 1960.